

REPORT OF ASBESTOS CONTAINING MATERIALS
SURVEY AND MANAGEMENT PLAN
LONG BEACH U.S. ARMY RESERVE CENTER
SCHROEDER HALL AND OMS BUILDING
LONG BEACH, CALIFORNIA

Survey also includes a limited PCB Label Inspection of transformers

PREPARED FOR:

63D Regional Support Command
AFRC-CCA-ENV
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PREPARED BY:

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ADECCO / TAD TASK ORDER DA7-000001559



Gil Bakshi
Certified Asbestos Consultant #99-2650
29 January 2001



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1.0 EXECUTIVE SUMMARY

INTRODUCTION

ITI of South Florida, Inc. (ITI) has completed a survey for asbestos-containing materials (ACM) and PCB Transformer Labels located at the Long Beach U.S. Army Reserve Center, Long Beach, California for the Administration Building (Schroeder Hall) and the OMS Building.

The scope of this work included the review of available records and an on-site investigative survey of facilities including bulk sample collection and analysis of suspect asbestos containing materials. Destructive survey techniques were not used. Accessible suspect asbestos containing building materials, including thermal system insulation and roofing materials, were evaluated. Representative material samples, including core samples, were collected from each homogeneous area of suspect ACM.

WARRANTY

The field and laboratory results reported herein (only if bulk samples are collected) are considered sufficient in detail and scope to determine the presence of accessible and/or exposed suspect asbestos containing building materials in the facility. ITI warrants that the findings contained herein have been prepared in general accordance with accepted professional practices at the time of its preparation as applied by similar professionals in the community. Changes in the state of the art or in applicable regulations cannot be anticipated and have not been addressed into this report.

The survey and analytical methods have been used to provide the client with information regarding the presence of accessible and/or exposed suspect asbestos containing building materials existing in the facility at the time of the inspection. Test results are valid only for material tested. There is a distinct possibility that conditions may exist which could not be identified within the scope of the study or which were not apparent during the site visit. This inspection covered only suspect accessible materials with no destructive survey techniques. The study is also limited to the information available from the client at the time it was conducted.

2.0 BACKGROUND INFORMATION

Based on the review of a previous asbestos survey prepared in August 1988 by IT Corporation (IT) and in March 1996 by Harding Lawson Associates and ITI's survey of the building, ITI has concluded that the following materials contain asbestos:

- 12" x 12" white mottled floor tile mastic (mastic only)
- Gray Roofing Mastic
- Transite asbestos cement flue pipe
- Joint Compound

In addition to the previous surveys, a total of 6 bulk samples of suspect ACM were collected by ITI from various locations throughout the facility. One of the samples was found to be positive when analyzed by Polarized Light Microscopy (PLM) analysis protocol recommended by the U.S. Environmental Protection Agency (EPA) (40 CFR 763).

The material tested by ITI that was found to contain asbestos was:

- Joint Compound

ITI performed the scope of this work under the direction of Gil Bakshi, Certified Asbestos Consultant. Every reasonable effort was made to access all pertinent data required to identify ACBM within the facility.

The following material was not tested but assumed to contain asbestos:

- Fire Doors
- Electrical Panels
- Roofing Mastic (OMS Building)

Any items that are not listed in this survey that may be disturbed during renovation or demolition activities must be assumed positive or tested.

3.0 DESCRIPTION OF FACILITIES

The Long Beach USARC is located at 3800 East Willow Street in Long Beach, California. Two buildings are located within the facility: the Administration Building (Schroeder Hall) and the Operation Maintenance Shop (OMS) Building. The buildings are used primarily for administrative and light vehicle maintenance purposes.

The Administration and OMS Buildings are constructed of brick and mortar exterior walls with mainly concrete cinder block and drywall interior walls and a built-up asphalt and gravel composition roof. The administration building contains approximately 22,520 square feet of floor space and the OMS building contains approximately 3,663 sq. ft. of floor space.

4.0 PREVIOUS INSPECTIONS

The 63D RSC provided ITI with two previous surveys performed by IT in 1988 and HLA in 1996. ITI reviewed the survey reports prior to visiting the site and referenced it to

confirm findings of the initial visual surveys performed by ITI. These surveys are presented in Appendix I.

5.0 SAMPLING AND ANALYTICAL PROCEDURES

During this survey, ITI accredited inspector, Mr. Gil Bakshi performed a walk-through of the subject building. This was performed in order to identify and delineate locations of homogeneous materials suspected of containing asbestos. A homogeneous material is defined as material that presents similar distinguishing features such as contents. Once homogeneous materials were identified, bulk samples were collected by ITI accredited inspector from materials in order to confirm the presence or absence of asbestos in suspect materials. Samples were collected in accordance with U.S. Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA).

BULK SAMPLES

The sample numbering scheme was as follows:

LB-MAIN-01

LB	=	Facility
MAIN	=	Building
01	=	Sample number

During the Inspection, sampling locations were recorded on floor plans.

Bulk samples were sent to LA Labs, Inc. for laboratory analysis. This independent laboratory successfully participates in the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos sample analysis. The samples were analyzed using Polarized Light Microscopy (PLM) analysis methodology coupled with dispersion staining solutions to distinguish the unique optical properties of mineral forms. Employing this method of analysis allows asbestos fiber characteristics to colonize, which enables the microscopist to verify the presence or absence, quantity and type of asbestos in the samples. Any product that contains more than one percent asbestos is considered to be ACM by EPA & OSHA. Any product that contains one tenth of one percent is considered Asbestos Containing Construction Materials (ACCM) by Title 8, Section 1529 of the California Code of Regulations (CCR). ITI performed QA/QC sampling for the total collected bulk samples (minimum of 10%). The PLM results are provided in Appendix A to this report.

6.0 ASSESSMENT METHODOLOGY

All Asbestos Containing Building Materials (ACBM) were classified into the following three types of suspect materials:

1. Surfacing Materials

2. Thermal System Insulation (TSI)
3. Miscellaneous Materials

ACM identified during the building survey was assessed according to the protocol described in 40 CR 763. The protocol evaluates the risk of exposure to airborne asbestos fibers by assessing the condition of each ACM and potential for that ACM to be disturbed and generate fibers. ACM was assessed according to each of the following factors:

- (1) Damaged or significantly damaged thermal system insulation ACM.
- (2) Damaged friable surfacing ACM.
- (3) Significantly damaged friable surfacing ACM.
- (4) Damaged or significantly damaged friable miscellaneous ACM.
- (5) ACBM with potential for damage.
- (6) ACBM with potential for significant damage.
- (7) Any remaining friable ACBM or friable suspected ACBM.

ASSESSING CONDITION AND FRIABILITY

The ability of an ACM to be crushed, or reduced to powder by hand pressure is described in 40 CFR Part 61, Subpart M (NATIONAL EMISSIONS FOR HAZARD AIR POLLUTANTS):

- Friable (F): ACM that can be crumbled, crushed, or reduced to powder by hand pressure.
- Nonfriable Category 1(NF1): Asbestos containing packing, gaskets, resilient floor coverings, asphalt roofing products, caulks, and mastics. These bituminous materials are assumed to remain nonfriable if demolition is performed using “normal” methods, but will become friable if severely weathered, sanded, or abraded.
- Nonfriable Category 2 (NF2): ACM excluding Category 1 nonfriable ACM, that, when dry and in its present form, cannot be crumbled, pulverized or reduced to powder by hand pressure; however, these materials may become friable during demolition activities. These products include Transite board and asbestos cement products.

The condition of ACM including severity and extent of damage is classified into one of the following categories:

- Significantly Damaged: ACM that is crumbled, blistered, gouged, marred, delaminated, or otherwise damaged either uniformly or locally over a substantial portion of its surface area.
- Damaged: ACM that is crumbled, blistered, gouged, marred, delaminated, or otherwise damaged either uniformly or locally overall a small portion of its surface area.
- Good: ACM with very little or no damage.
- Potential for Disturbance: The potential for disturbance of each ACM was evaluated with respect to the types and frequency of occupancy, whether the ACM was accessible to area occupants, including vibration and air erosion.

See Appendix B for details and description of Potential for Disturbance Factors.

HAZARD RANKING ASSESSMENT METHODOLOGY

This hazard assessment combines the level of potential disturbance with the current condition of the ACM to indicate overall hazard potential. After the current conditions from the inspection report is determined, the ACBM will be classified as “significantly damaged”, “damaged” or “good” (40 CFR 763). The rankings of potential hazard range from 1 – most hazardous , to 7 – least hazardous. The highest rank is reserved for ACBM which is “significantly damaged”.

See Appendix C for details and Classification Scheme Flowchart.

See Appendix D for details on Response Action Schemes based on Hazard Rankings.

7.0 RESPONSE ACTIONS

ITI’s Response Actions (RA) and abatement priority for each ACM were based on the results of the assessment. Prioritization also has seven classifications: Priority (1) indicated that an ACM represents an immediate hazard and should be isolated and removed as soon as possible. Priority (7) indicated that an ACM represents little risk of exposure and should be managed in place. RA’s include one or more of the following:

- Operations and Maintenance (O & M) Program: Managing all ACM in accordance with a properly designed and implemented O & M Program. An O & M Program has three components:
 1. Identification, training, and notification requirements designed to prevent inadvertent disturbance of ACM.
 2. Periodic surveillance of ACM to monitor its condition and modify the response actions or the program, as necessary.
 3. Procedures to repair damaged ACM, clean up debris, and respond to fiber releases in the event that ACM is damaged or dislodged.

- Repair: Returning all damaged ACM to an undamaged or intact state through limited replacement and patching.
- Encapsulation: Treating ACM with a liquid that, after proper application, surrounds or embeds asbestos fibers in an adhesive matrix designed to prevent fiber release.
- Enclosure: Installing airtight barriers surrounds the ACM to prevent further damage and exposure to occupants.
- Removal: Stripping ACM from its substrate within regulated area using trained abatement workers; properly containerizing and disposal of the waste in a landfill.

8.0 ASBESTOS CONTAINING MATERIALS

Administration Building

- 12" x 12" white mottled floor tile mastic (mastic only)
According to the HLA survey, this material contains a trace amount of Chrysotile asbestos as a composite sample. Asbestos was not detected in the floor tile and the mastic contains 1 to 25 percent Chrysotile asbestos. Approximately 15,000 square feet of this material is located within the administration building. This material is nonfriable and was in good condition at the time of the survey. ITI has assigned a hazard ranking of 6 and an RA of 6.
- Gray roofing mastic
According to the HLA survey, this material contains 15 to 20 percent Chrysotile asbestos. Approximately 20 square feet of this material is located on pipe penetrations and other various areas on the roof area of the building. The material is nonfriable and was in good condition at the time of the survey. ITI was unable to identify this material. (See Section 11.0)
- Transite asbestos cement flue pipe
According to the HLA Survey, there is 4 linear feet of this material on the roof area. Transite is a known ACM and should be assumed to contain greater than 5 percent asbestos. HLA indicated this material was nonfriable and in good condition when HLA conducted the survey in 1996. ITI was unable to identify this material on the roof of the administration building. (See Section 11.0)
- Joint Compound
According to the ITI survey, this material contains 2% Chrysotile Asbestos. There is approximately 5,000 sq. ft. of this material located throughout the building. The material was in good condition at the time of the survey. ITI has assigned a hazard ranking of 6 with an RA of 6.

9.0 SUSPECT ASBESTOS CONTAINING MATERIAL

- Fire Doors
- Electrical Panels
- Roofing Mastic (OMS Building)

10.0 NON ASBESTOS CONTAINING MATERIAL

Asbestos was not detected in samples of the following materials collected by IT & HLA:

Administration Building

- Hot water tank insulation
- Drywall – The Joint Compound is asbestos containing (See Section 8.0)
- 12" x 12" speckled beige floor tile
- Built up asphalt and gravel composition roofing felt
- 12" x 12" inch acoustic pegboard tiles
- Pegboard wallboard
- Built up asphalt and gravel composition roofing felt
- Gray baseboard and associated mastic

OMS Building

- Built up asphalt and gravel composition roofing felt, not including mastic (See Section 11.0)

Asbestos was not detected in samples of the following materials collected by ITI:

Administration Building

- Pipe Wrap (ladder room)

11.0 PREVIOUS ABATEMENT RECORDS

The roofs of the Administration Building and OMS Building had been replaced since the HLA survey (1999/2000). Facility personnel were unable to identify records that transite on the roof had been completely removed.

12.0 BULK SAMPLE ANALYSIS SUMMARY

<u>Sample Number</u>	<u>Location</u>	<u>Asbestos Content</u>
LB-1	Joint Compound (Administration Bldg)	None
LB-2	Joint Compound (Administration Bldg.)	None
LB-3	Joint Compound (Administration Bldg)	2%

LB-4	Pipe Wrap (Ladder Room)	None
LB-5	Pipe Wrap	None
LB-6	Pipe Wrap	None
LB-1	QA	None

13.0 PCB

There was one pad transformer located in the parking lot of the administration building. There were no labels indicating this transformer contained PCB's.

14.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings above, ITI recommends the following:

- Observations for detected asbestos was based on visible and accessible materials; therefore, asbestos containing materials may be present in inaccessible areas such as ceiling plenums, crawl spaces, attics, etc.
- An imminent asbestos hazard was not present at the facility during the site visit.
- This report is not intended to be an asbestos abatement design document and should not be used for the purpose of obtaining quotes.

Based on the asbestos present in the building, ITI recommends the following:

- Develop and implement an O & M Plan for all known and suspect ACM

There are three primary objectives of the O & M program: (1) clean up existing contamination (2) minimize further fiber release by controlling access to ACM, and (3) maintain ACM until it is eventually removed. Properly prepared and implemented, this plan will document the building owner's prudence in dealing with asbestos in the building.
- Elements of the O & M Program
 - Notification and Labeling
 - A visual record of the type and location of known or assumed ACM within the building
 - Training
 - Employee protection and medical surveillance programs
 - Specialized cleaning procedures
 - Maintenance / Renovation work permit system
 - Special work practices for maintenance activities
 - Special work practices for renovation
 - Emergency response products
 - Periodic ACM surveillance: and
 - Record keeping

- General awareness training must be presented to maintenance and custodial workers whose work responsibilities may require contact with ACM or suspect ACM.

Training and periodic surveillance: Training shall include, but not be limited to:

- (i) Information regarding asbestos and its various uses and forms.
- (ii) Information on the health effects associated with asbestos exposure.
- (iii) Locations of ACBM identified throughout each building
- (iv) Recognition of damage, deterioration, and delaminating of ACBM.
- (v) Descriptions of the proper methods of handling ACBM.
- (vi) Information on the use of respiratory protection as contained in the EPA/NIOSH Guide to Respiratory Protection for the Asbestos Abatement Industry, September 1986 (EPA 560/OPPTS-86-001), available from the Director, Environmental Assistance Division (7408), Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency, Room E-543B, 401 M St., SW., Washington, DC, 20460.
- (vii) Provisions of this section and Sec. 763.91, Appendices A, B, C, D of this subpart E of this part, EPA regulations contained in 40 CFR part 763, subpart G, and in 40 CFR part 61, subpart M, and OSHA regulations contained in 29 CFR 1926.1101.
- (viii) Hands-on training in the use of respiratory protection, other personal protection measures, and good work practices.

Periodic surveillance: At least once every 6 months after a management plan is in effect, the Owner should conduct periodic surveillance in each building that contains ACBM or is assumed to contain ACBM.

Each person performing periodic surveillance shall: Visually inspect all areas that are identified in the management plan as ACBM or assumed ACBM and record the date of the surveillance, his or her name, and any changes in the condition of the materials.

- Training Requirements of the DOSH Asbestos Standard.

The DOSH asbestos standard (8 CCR § 1529) includes training requirements that are triggered by exposures exceeding the PEL. Unless employees receive an appropriate level of training, those employees who work in buildings that contain ACM run the risk of disturbing the materials.

Pursuant to 29 CFR 1926.1101, employers must provide “Class IV” training to all employees who engage in activities during which they may contact known or suspect ACM or who engage in activities to clean up ACM debris. DOSH defines Asbestos Containing Construction Material as containing greater than 0.1 percent asbestos. These employees include custodial or maintenance employees employed by or contracted on behalf of the USARC.

- Conduct periodic surveillance of all areas that contain known or suspect ACM.

Periodic review of the O & M program is essential to insure that the program objectives are being met. A key feature of the review is re-inspection of all ACM in the building. Combined with ongoing report of changes in the condition of the ACM made by service workers, the re-inspection will insure that any damage or deterioration of the ACM will be detected and corrective action taken. Re-inspection should be conducted at least annually; more frequently if necessary. AHERA required surveillance every six months and re-inspection every three years by an accredited Building Inspector.

- Health and Safety Code §25915 et seq.

Also known as the Connelly Bill, these sections of the California Health and Safety Code require that all employees, outside contractors, and co-owners, including building occupants, be notified in writing regarding:

- Existence, location, accessibility, conclusions, and contents of asbestos survey reports and the asbestos management plans.
- Specific locations of ACM.
- General procedures and handling restrictions to prevent or minimize disturbance, release, or exposure.
- Bulk and air sampling results, including the sampling and analytical procedures used.
- Potential health risks or impacts that might result from exposure.

All occupants, employees, and owners must receive the above notification within 15 days following receipt of a survey report by the owner and annually thereafter. New occupants, employees, and owners must receive the above notification within 15 days from the start of the relationship. All contractors should be notified regarding ACM onsite.

- Health and Safety Code §25249

The Safe Drinking Water and Toxic Substances Enforcement Act of 1986 (Proposition 65) applies to businesses of 10 or more employees and requires a warning of the risk of exposure to asbestos in buildings unless that exposure can be shown to be below the “no significant risk” (NSR) level or equal to background levels.

A clear and reasonable “environmental exposure” warning sign must also be posted at least in each area where damaged ACM is present.

Signs typically read:

“WARNING: This area contains a chemical known to the State of California to cause cancer” OR “WARNING: This facility contains asbestos, a substance known to the State of California to cause cancer”.

➤ Title 29 CFR 1926.1101 (OSHA)

The Occupational Safety and Health Administration requires notification prior to and immediately following the performance of any work covered by the standard.

The building operator must notify in writing the following persons who will occupy or perform work in areas containing known or suspected ACM of the presence, location, and quantity of known and suspected ACM:

- Prospective employers applying or bidding for work in or adjacent to areas containing known or suspected ACM
- Employees of the owner who will work in or adjacent to areas containing known or suspected ACM
- On multi employer worksites, all employees who will perform work in or adjacent to areas containing known or suspected ACM
- Tenants who will occupy areas containing known or suspected ACM

Refer to 29 CFR 1926.1101 and 8 CCR § 1529 for complete owner notification requirements.

If building demolition or renovation activities will disturb ACM, such activities must be preceded by removal of the affected ACM as required by Federal, State and Local Regulations.

- ACM removal must be performed by a licensed and registered asbestos abatement contractor, in accordance with 8 CCR § 1529.
- Friable asbestos waste and debris containing greater than 1 percent asbestos must be transported by a qualified hazardous waste hauler and disposed of in manner consistent with applicable regulations at a landfill with operating permits and waste discharge requirements that allow it to accept asbestos containing waste.
- If ACM removal is performed, an asbestos abatement project design should be prepared. This project design may consist of technical specifications and drawing or a detailed work plan. The asbestos abatement project design must be prepared by a project designer accredited pursuant to AHERA.

- Asbestos abatement project design, management and monitoring should be conducted by a DOSH Certified Asbestos Consultant (CAC) and / or certified site surveillance technician (CSST).

Important Values / Definitions from Title 8 CCR § 1529, US EPA & OSHA

Asbestos Containing Material

"Asbestos-containing material (ACM)", means any material containing more than one percent asbestos.

Asbestos Containing Construction Material

"Asbestos-containing construction material" means any manufactured construction material which contains more than one tenth of 1 percent asbestos by weight.

"Asbestos-related work" means any activity which by disturbing asbestos-containing construction materials may release asbestos fibers into the air and which is not related to its manufacture, the mining or excavation of asbestos-bearing ore or materials, or the installation or repair of automotive materials containing asbestos. Asbestos-related work does not include the installation, repair, maintenance, or nondestructive removal of asbestos cement pipe used outside of buildings if the work operations do not result in employee exposures to asbestos in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8-hour time-weighted average and the employees and supervisors involved in the work operations are trained and certified by an asbestos cement pipe training program which is approved by the Division.

Permissible Exposure Limits (PELS).

(1) Time-weighted average limit (TWA). The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA).

(2) Excursion limit. The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes.

Notification

The following is a summary of the major asbestos notification and information requirements in 8 CCR 1529, 5203, 341.6-341.14 and the California Health & Safety Code. See the codes for the complete requirements. Note: Employers also have additional informational duties towards their employees under 8 CCR 1529, 1509 or 3203 (the Injury and Illness Prevention Program requirements for construction and general

industry), 3204 (Access to Employee Exposure and Medical Records), as well as other Title 8 regulations.

Employers performing work subject to 8 CCR § 1529:

- If less than 100 sq. ft. of asbestos-containing construction materials and therefore not subject to the asbestos registration rules, file a Report of Use with the Chief of DOSH (Cal/OSHA)
- Determine the location and quantity of asbestos-containing material (ACM) and/or presumed ACM (PACM) based on the criteria in 1529(k)(1); {ref. 1529(k)(3)(A)}
- If at a temporary worksite, notify the nearest Cal/OSHA District Enforcement Office 24 hours prior to work (ref. 1529(r) & 5203)
- Any incident resulting in an employee exposure in excess of the PEL and/or excursion limit by reporting in writing to the Chief of DOSH within 15 days. (ref. 1529(r) & 5203)
- Through meetings or other methods, inform employees, building owner and other employers on site, prior to work, about the location and quantity of ACM and/or PACM, the nature of their work, requirements pertaining to regulated areas, as well as the means to prevent asbestos air contamination; and {ref. 1529(d)(1) & (k)(3)(B)}
- Post a warning sign outside the regulated area that is understandable to employees working in and contiguous to the area {ref. 1529(e)(2) and (k)(7)}
- As soon as possible, notify affected employees regarding the results of personal air monitoring {ref. 1529(f)(5)}
- Within 10 days of completing the work, regarding the location and quantity of remaining asbestos, as well as any final monitoring results {ref. 1529(k)(3)(C)}

See 8 CCR 1529 for the exact requirements. There are additional notification duties to the local air quality district or the U.S. EPA.

Notification Under Title 40, Part 61, Subpart M (NESHAPS) – US EPA

- Notifications for renovations are required for the following activities which involve greater than 160 square feet, 260 linear feet or 35 cubic feet, cumulative per facility over one year.
- Notifications for demolitions are required for all demolitions of facilities.

- Please note that State Regulations may be more stringent than EPA Federal Regulations.

15.0 COST ESTIMATION

ITI's asbestos abatement cost estimates are listed below for each type of material found to be positive / confirmed asbestos containing in this report. Square footage costs were prepared on the basis of historical units costs and information contained in the "Means Building Construction Cost Data" Manual (Unit Costs). ITI's estimated costs listed below may be higher than unit costs to help compensate for the many variables involved in the asbestos abatement industry. It is always recommended to have an asbestos abatement contractor quote the project to get current and valid cost estimates at the time the USARC will perform the abatement.

Please note that conditions such as separating the work in small projects vs. one large project will greatly increase the cost. In addition, conditions such as weather and time of year will also impact the cost. All unit costs estimates listed below do not include estimated costs for project designs, air monitoring and consulting fees. Estimates are provided if all ACM is assumed to be removed at the same time and does not include the demolition of construction debris to access the ACM.

Estimated Project Designer Fees:	\$2,000 – 5,000
Estimated Air Monitoring Fees:	\$400 – 500 / day
Estimated Consulting Fees:	\$50 – 70 / hour

Administration Building

- | | |
|---|--------------------|
| ➤ 12" x 12" white mottled floor tile mastic (mastic only)
Approximately 15,000 square feet | \$3.00 per sq. ft. |
| ➤ Joint Compound
Approximately 5,000 sq. ft | \$5.00 per sq. ft. |

PHOTOS OF SITE



Administration Building



Roof of Administration Building (New)



Transformer on Site



ROOF
MASTIC
ADMIN. LOG
1999

CERTIFICATE CONCERNING ASBESTOS REMOVAL

The undersigned, CST Environmental, Inc. (a licensed California Contractor, Section II) has completed the removal of asbestos containing material from various areas of roof of the administration building located at the U.S. Army Reserve Center, 3800 East Willow Street, Long Beach, California (The Project). In connection with such work, the undersigned hereby certifies to the United States Army Reserve (The Owner) as follows:

1. The South Coast AQMD and CAL/OSHA were notified of the project by the filing of the Asbestos Removal Notification information sheet, attached hereto in Section III.
2. The project was conducted on June 17, 1999 in accordance with EPA, SCAQMD and CAL/OSHA guidelines and regulations, including specifications concerning use of pressure differential system, personal protection and decontamination of workers, air monitoring, work area decontamination and disposal
3. The workers employed on the project were the following persons: Steve Dougherty and Billy Novikoff. Each of them has completed all necessary training, including their respirator fit test, and has signed CST Environmental's acknowledgment statement, attached in Section IV.
4. CST Environmental requires an annual physical examination of each asbestos exposed worker in accordance with OSHA medical monitoring requirements. Each employee was found to be in good health, as evidenced by the copies of their medical examinations, attached in Section IV.
5. Daily Supervisor Report and Containment Log for the project are attached in Section V.
6. Personal air monitoring performed on site was analyzed by Environmental Data Management. Results are attached in Section VI.
7. A total of 1 bag at .6 yards of asbestos containing material was removed as evidenced by the non-hazardous waste manifest #043351, attached in Section VI.



ENVIRONMENTAL, INC

8. The asbestos containing material (roof mastic, transite, poly, coveralls, tape, etc.) removed from the building, was doubled bagged and labeled by CST Environmental. The material was hauled by Martin Environmental Services and disposed of at BFI/La Paz County Landfill, Parker, Arizona. The hauler permit and landfill fact sheets are attached in Section VII.

Signed and Submitted this 15th day of July, 1999.

By.

A handwritten signature in black ink, appearing to read "Subhas", written over a horizontal line.

Subhas "Sage" Khara
President

DAILY SUPERVISOR'S REPORT

DATE: 6/17/99 DAY OF WEEK: WEDNESDAY

JOB NAME: 125 ARMY RESERVE GTR JOB LOCATION: 3800 E WILLOW LONG BEACH

JOB #: 99-446a SUPERVISOR: B. NOLKOFF

PERSONAL SAMPLES # 1 STEL SAMPLES # 1 NEG. AIR SAMPLES #

MEN ON JOB # 2 SUBS ON JOBSITE #

WORK COMPLETED (Specific): BEGAN SHIFT 7:00am - SET UP LADDER AND EQUIP.
REMOVED APPROX. 2 PENETRATIONS ON FIRST ROOF MOVED TO 2nd
ROOF AND REMOVED TWO 4' LENGTHS OF TRANSITE PIPE FROM ROOF
ALONG W/ MASTIC ON PENETRATIONS. FINISHED MASTIC ON 3rd
LOWER ROOF. LOWERED RAGS AND EQUIP AND ENDED SHIFT. 3:00pm

WORK GOALS FOR NEXT SHIFT:

PROBLEMS:

VISITORS (NAME, AGENCY, DISCUSSION):

INJURIES

PREVIOUS MANDAYS	CURRENT	TODAY
<u>0</u>	<u>2 n/d</u>	<u>2 n/d</u>

CERTIFICATE OF COMPLETION
ASBESTOS ABATEMENT PROJECT

PROJECT: Asbestos Abatement Monitoring
Kitchen Area - Administration Building
U S Army Reserve Center
Long Beach, California

SCOPE OF WORK: Removal of all asbestos-containing materials as outlined in the scope of work transmitted to Integrity Environmental Consultants, Inc. on November 20, 1998 by 63D Regional Support Command and included approximately 260 square feet of vinyl floor tiles and mastic

OWNER: 63D Regional Support Command
AFRC-CCA-ENS, Building 7
1200 Lexington Drive
Los Alamitos, California 90720-5002

CONSULTANT: Integrity Environmental Consultants, Inc.

CONTRACTOR: AC and S

PROJ. DURATION: December 11, 1998

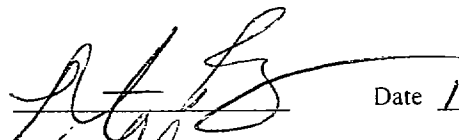
- 1 This is to certify that we have supervised proper removal and disposal of all the above-referenced asbestos-containing building materials
- 2 That throughout the work all applicable regulations and requirements of the owner specifications were observed
- 3 That any person who entered the designated work area was protected with the required full-body disposable clothing and adequate respiratory protection. All workers followed the prescribed entry/exit procedures as well as the proper operating procedures throughout their presence in the work areas
- 4 That all employees of **AC and S**, engaged in this work, were trained in respiratory protection and experienced with asbestos abatement work. These workers had complete medical records authorizing them to work in respirators and were not exposed at any period of work without the benefit of adequate respiratory protection
- 5 That conditions inside the work area were always safe, and that the maximum asbestos fiber count outside the work areas did not exceed 0.01 fiber per cubic centimeter (f/cc) of ambient air.
- 6 That **Integrity Environmental Consultants, Inc.** performed final inspection, air sampling, and testing recommended by applicable regulations. The work performed by **AC and S** was found satisfactory, and final clearance air sample analyses indicated particulate concentrations within acceptable levels of 0.01 f/cc

AC and S:

Project Competent Person

Name ROBERT F. COLES

Signature

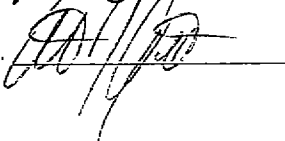


Date 12-15-98

Principal In Charge

Name Albert J. GAMA

Signature



Date 12-15-98

Integrity Environmental Consultants, Inc.

Principal In Charge

Name Massoud Rahdari
CAC#92-0376/REA#04138

Signature



Date 12/11/98

COST ESTIMATE FOR ASBESTOS ABATEMENT AND REMOVAL

SCOPE OF WORK

Subject: Asbestos Abatement at Long Beach U.S. Army Reserve Center, Long Beach, California

Description of Work:

Conduct an asbestos abatement for removal of 12-inch by 12-inch white mottled floor tile and associated mastic at the kitchen room/area of Long Beach U.S. Army Reserve (USAR) Center, California. The Center is located at 3800 E. Willow Street, Long Beach, California. The area for abatement to be performed is approximately 260 sq. ft. in area. The floor plan/layout of the building is attached as Enclosure-1. The USAR building is currently occupied and there are full-time administrative personnel working in the building.

Asbestos containing material (ACM) was identified in a comprehensive survey conducted in 1996. An asbestos sampling and analyses had been performed for the floor tile and associated mastic by an accredited laboratory. Analytical results indicate that this material contains a trace amount of chrysotile asbestos as a composite sample. Asbestos was not detected in the floor tile and the mastic contains 1-5% chrysotile asbestos in the kitchen area. The material is non-friable.

Air monitoring of the area needs to be performed as part of the asbestos abatement work to ensure clearance on the project after completion. Air samples prior to the start of abatement and during the project shall be collected. Final air clearance sampling and analyses shall be performed prior to the removal of work area barriers.

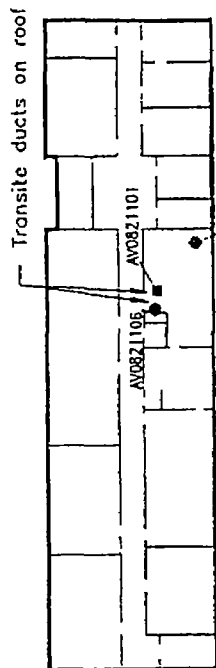
General:

All work shall be performed by a State of California licensed contractor and in accordance with federal, state, and local laws and regulations. The scope of the project involves proper removal and disposal of non-friable ACM as defined by South Coast Air Quality Management District (SCAQMD) Rule 1403 – Asbestos Emission from Demolition/Renovation Activities.

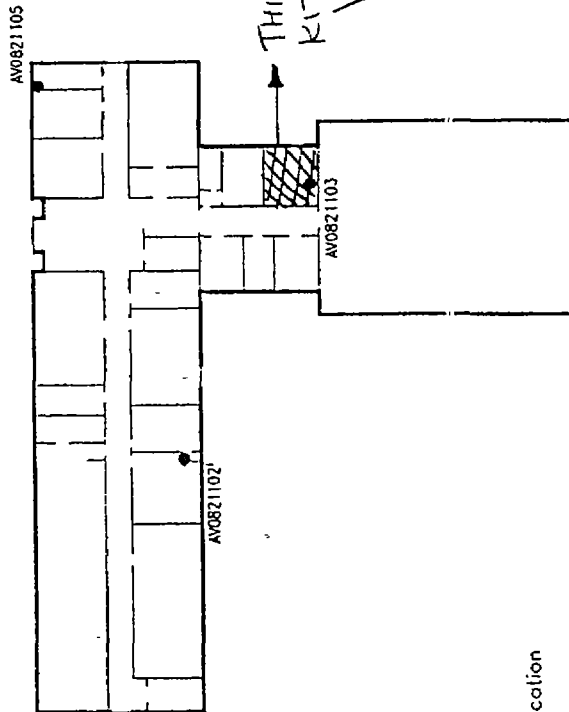
Report:

Prepare a brief closure report with description and attach copies of air monitoring results and manifest forms for disposal. One (1) copy of the report shall be submitted to the 63D RSC, Engineers Office, Environmental Division.

If you need any additional information, please contact Ms. Shyama Sundaram at Phone: (562) 795-1442, Fax: (562) 795-1499.



ADMINISTRATION BUILDING -
SECOND FLOOR



ADMINISTRATION BUILDING -
FIRST FLOOR

EXPLANATION

- Bulk sample location
- Roof sample location

Scale 0 50 100 feet
APPROXIMATE

OPERATIONS
MAINTENANCE
SHOP

Not to scale

ASBESTOS SURVEY -
ADMINISTRATION BUILDING AND
OPERATIONS MAINTENANCE SHOP
U.S. Army Reserve Center
Long Beach, California

APPROVED
DATE
1/96



REPLY TO
ATTENTION CF

DEPARTMENT OF THE ARMY
HEADQUARTERS, 63D REGIONAL SUPPORT COMMAND
PO BOX 3001
LOS ALAMITOS, CALIFORNIA 90720-1301

AFRC-CCA-EN (200-1)

ENVM-98-59
10 December 1998

MEMORANDUM FOR Facility Manager, ATTN: Mr. Frank Williams
Schroeder Hall U.S. Army Reserve Center
3800 E. Willow Street, Long Beach, CA 90822

SUBJECT: Notification of Asbestos Containing Floor Tile and Mastic Removal at the Kitchen Area of Long Beach U.S. Army Reserve Center, California

1. The 63D Regional Support Command (RSC), Engineers Office is in the process of renovating the kitchen area at the Schroeder Hall U.S. Army Reserve Center, Long Beach, California. Due to this proposed renovation, the floor tile of the kitchen area needs to be removed. Asbestos-containing material (ACM) was not detected in the floor tile but the associated mastic was found to contain 1 – 5% non-friable chrysotile asbestos.
2. The 63D RSC, Engineers Office, Environmental Division has coordinated with the asbestos abatement Contractor for removal and disposal of the non-friable ACM in the kitchen area of the Reserve Center. The abatement work will be performed by the Contractor on Friday, 11 November 1998 and will commence at 0800 hours. The project will be completed in one day consisting of one 8-hour shift. During this project, ensure that no other clean-up activity occurs within the building because air monitoring and sampling is sensitive to any kind of disturbance in the air. All personnel within the building will be notified of the abatement work
3. The Contractors involved with the project are as follows:
 - a. Integrity Environmental Consultants, Inc. (Abatement Monitoring/Sampling work)
 - b. ACandS, Inc. (Asbestos Removal and Disposal work)Properly trained and certified personnel in accordance with local, state, and federal regulations will perform all work.
4. Should you have any questions regarding the project, please do not hesitate to contact Ms. Shyamala Sundaram, phone: (562) 795-1442 of the 63D RSC Engineers Office, Environmental Division.

KENNETH R. WILHELM
LTC, EN
Regional Engineer

CF:
63D RSC Safety Office (Mr. Pelesasa)



Forensic Analytical

San Francisco • Los Angeles • Minneapolis / St. Paul

November 12, 1998

VIA FACSIMILE TO:

(831) 883-1415

Pages: 3

Brown & Root
P.O. Box 725
Marina, CA 93933-0725
ATTN: Rick

Re: Bulk Sampling and Analysis for Asbestos
U.S. Army Reserve Center, Long Beach, CA
Admin. Bldg. Former Firing Range – Wall tile mastic

Dear Rick:


At the request of Cliff Canty, on November 9, 1998, Mr. Stephen Long, CAC #92-0580, of Forensic Analytical collected bulk material samples of mastic beneath fiberglass 1' x 1' acoustic wall tiles from the above referenced site,

Three samples of the were collected from different locations in the former firing range. Specific sample locations are shown on the attached Bulk Sample Request Form.

The samples were submitted to Forensic Analytical's laboratory in Rancho Dominguez, California for analysis for possible asbestos content utilizing Polarized Light Microscopy (PLM) with dispersion staining as recommended by the EPA. No asbestos was detected in any of the samples.

Laboratory Report No. B005839 is attached for you record. If you have any questions, please contact me on (310) 763-2374.

Respectfully,
Forensic Analytical Specialties, Inc.


Stephen B. Long
Project Manager
Environmental Services Division
Certified Asbestos Consultant, Cert. No.: 92-0580

cc w/encls: FASI/File-LA/3234-2310



Forensic Analytical

Final Report

San Francisco • Los Angeles • Minneapolis / St. Paul

Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Brown & Root
Cliff County

P.O. Box 725
Marina, CA 93933-0725

Client ID: 3234
Report Number: B005839
Date Received: 11/10/98
Date Analyzed: 11/12/98
Date Reported: 11/12/98

Job ID / Site: U.S. Army Reserve Center, JOC II, 3800 E. Willow, Long Beach, CA.

FASI Job ID: LE2310

Sample Number	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
AR-1A	59854798						
Layer: Brown Mastic			ND				
Layer: Paint			ND				

Total Composite Values of Fibrous Components: Asbestos (ND) Cellulose (Trace) Fibrous Glass (Trace)							
---	--	--	--	--	--	--	--

AR-1B	59854799						
Layer: Brown Mastic			ND				
Layer: Orange Fibrous Material			ND				

Total Composite Values of Fibrous Components: Asbestos (ND) Cellulose (Trace) Fibrous Glass (Trace)							
---	--	--	--	--	--	--	--

AR-1C	59854800						
Layer: Brown Mastic			ND				
Layer: Paint			ND				

Total Composite Values of Fibrous Components: Asbestos (ND) Cellulose (Trace) Fibrous Glass (Trace)							
---	--	--	--	--	--	--	--

Matilde Antillon

Matilde Antillon, Laboratory Supervisor, Rancho Dominguez Laboratory

Note: Limit of Quantification (LOQ) = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by Forensic Analytical to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by Forensic Analytical. The client is solely responsible for the use and interpretation of test results and reports requested from Forensic Analytical. This report must not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government. Forensic Analytical is not able to assess the degree of hazard resulting from materials analyzed. Forensic Analytical reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified.

Page 1 of 1

BULK SAMPLE REQUEST FORM

CLIENT NAME & ADDRESS: Brown & Root XXXXXXXXXX P.O. Box 725 Marina, CA 93933-0725		PHONE:		DATE: 11/9/98	
		Circle the Method and Turn Around Time 6 hr <input checked="" type="checkbox"/> 24hr <input type="checkbox"/> 48hr <input type="checkbox"/> Ext <input type="checkbox"/>		Results Needed: 11/10/98	
		ANALYZE TO 1ST POSITIVE? YES / NO			
		PLM: Standard / Point Count		Gravimetry Prep	
CONTACT: Mr. Cliff Canty		TEM: QUAL / QUANT. / WATER			
P.O.# 30611		JOB # 3274-23.0		AA/Flame AA/Furnace ICP	
SITE: 3800 E. Willow, Long Beach, CA		METALS:			
SAMPLE NUMBER	DATE COLLECTED	SAMPLE LOCATION/DESCRIPTION			
AR-1A	11/9/98	Admin. Bldg. - Room 111 (Former Firing Range) - Brown mastic under 1' x 1' fiberglass wall tile			
AR-1B		- 1 wall, near center			
AR-1C		Ceiling, Wedge - near center of wall			
Sampled by: <i>[Signature]</i>		Date: 11/9/98		Time: 1345	
Relinquished by: <i>[Signature]</i>		Received By:			
Date/Time: 11/10/98 - 0900		Date/Time: Sealed Condition (circle one) YES / NO			



Forensic Analytical

FAX TRANSMISSION

DATE: 12/02/98 TIME OUT: 1325
TO: HERB JENSEN
COMPANY: BROWN & ROOT
FROM: KIRBY

This facsimile is from FORENSIC ANALYTICAL SPECIALTIES, INC., of Rancho Dominguez, California.

A total of 4 pages, including this cover sheet, are being sent. If you do not receive all pages indicated, please contact the undersigned at (310) 763-2374.

MESSAGE: REPORT FOR ASBESTOS TESTING
U.S. ARMY RESERVE CENTER, LONG BEACH

Person Transmitting Facsimile

FAX Number Called: (831) 883-1415

FAX Reply Number: (310) 763-8684

APPENDIX A

Attn.:
 ITI
 100 2nd Ave S #2005
 St. Petersburg, FL 33701

Wednesday, January 10, 2001

Ref Number: PS0147

POLARIZED LIGHT MICROSCOPY (PLM)

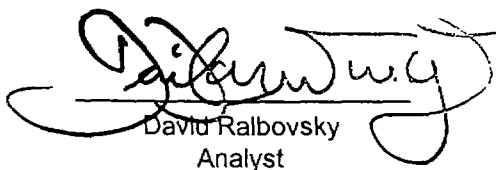
Performed by EPA 600/R-93/116 Method*

Project: 63rd PSC (Long Beach).

Sample	Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS	
				%	Type	% Fibrous	% Non-Fibrous
LB-1	admin	Brown/White Fibrous Homogeneous	Teased	None Detected		20% Cellulose	60% Gypsum 20% Other
LB-2	admin.	White Fibrous Homogeneous	Crushed/Teased	None Detected		10% Cellulose	60% Gypsum 30% Other
LB-3	admin	White Non-Fibrous Homogeneous	Crushed/Dissolved	2%	Chrysotile	8% Cellulose	15% Quartz 30% Ca Carbonate 45% Other
LB-4	ladder rm	Silver/White Fibrous Homogeneous	Teased	None Detected		30% Cellulose 10% Glass	60% Other
LB-5	ladder rm.	Blue/White/Yellow Fibrous Homogeneous	Teased	None Detected		30% Cellulose 50% Glass	20% Other
LB-6	ladder rm	Blue/White Fibrous Homogeneous	Teased	None Detected		50% Cellulose 5% Glass	45% Other

Comments. For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples analyzed by ELAP 198.1 Method.


 David Ralbovsky
 Analyst


 Approved
 Signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. LA Testing suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval by LA Testing. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

Analysis performed by LA Testing, Inc. (NVLAP Accredited Bulk #200232-0 State CA 2283 AZ AZ0921, TX 43369)

CHAIN OF CUSTODY

P30147



Date: 9/21/00
 Your Name: GI BgH
 Company: III
 Address: 100 2nd Ave S #2005
 City, State Zip: ST. Petersburg, FL 33701

LA TESTING - Bill To.
 Name: _____
 Company: _____
 Address: Spr
 City, State Zip: _____

Phone Results To: 727-898-0802
 Fax Results To: 727-581-0764

Purchase Order #: 105 AL
 LA TESTING-SALES REP: STEVE PARKS

Project Name / Number: L3^{er} PSC (Long Beach)

Requested Analysis Place (x)

ASBESTOS	RUSH	6 HR	12 HR	24 HR	48 HR	72 HR	5 DAY	> 6 DAYS
----------	------	------	-------	-------	-------	-------	-------	----------

TEM AIR

EPA LEVEL II	***							
NIOSH 7402	***							

PCM AIR

NIOSH, OSHA								
-------------	--	--	--	--	--	--	--	--

PLM BULK

EPA 600/R-93/116								
EPA Point Count								
GRAVIMETRIC								

TEM BULK

Drop Mount (qualitative)								
Conventional								
Chertfield - Gravimetric								
Microvac (ASTM)								
Microvac (qualitative)								
Wipes (qualitative)								
Wipes (quantitative)								

TEM - WATER

Drinking Water								
Waste Water, Sludge								
Solvents, Chemicals, Oil								

LEAD	RUSH	6 HR	12 HR	24 HR	48 HR	72 HR	5 DAY	> 6 DAYS
------	------	------	-------	-------	-------	-------	-------	----------

FLAME AA								
----------	--	--	--	--	--	--	--	--

Client Sample Numbers: LB-1 - LR-6

Total Number Of Samples: 6

Relinquished By: _____
 Received By: Chadler Stang
 Relinquished By: _____
 Received By: _____

Date: 9/21/00 Time: 9:00 PM
 Date: 9-4-01 Time: 6:00
 Date: _____ Time: _____
 Date: _____ Time: _____

CHAIN OF CUSTODY

PS01910



Date: _____
 Your Name: Gil R. Kelly
 Company: LA
 Address: 100 2nd Ave S, #2005
 City, State Zip: ST. Petersburg, FL 33701

LA TESTING - Bill To: FAR
 Name: _____
 Company: _____
 Address: _____
 City, State Zip: _____

Phone Results To: 727-898-0802
 Fax Results To: 727-581-0769

Purchase Order #: _____
 LA TESTING SALES REP: STEVE PARKS

Project Name / Number: QA Samples

Requested Analysis. Place (x)

ASBESTOS	RLSH	6 HR	12 HR	24 HR	48 HR	72 HR	5 DAY	> 6 DAYS
----------	------	------	-------	-------	-------	-------	-------	----------

TEM AIR

EPA LEVEL II	***							
3HERA	***							
NIOSH 402	***							

PCM AIR

NIOSH, OSHA								
-------------	--	--	--	--	--	--	--	--

PLM BULK

EPA 600/R 93/116				X				
EPA Pore Count								
GRAVIMETRIC								

TEM BULK

Drop Method (qualitative)								
Conventional								
Chalfield - Gravimetric								
Microvac (ASTM)								
Microvac (qualitative)								
Wipes (qualitative)								
Wipes (quantitative)								

TEM - WATER

Drinking Water								
Waste Water Sludge								
Solvents, Chemicals, Oil								

LEAD	RLSH	6 HR	12 HR	24 HR	48 HR	72 HR	5 DAY	> 6 DAYS
------	------	------	-------	-------	-------	-------	-------	----------

FLAME AA								
----------	--	--	--	--	--	--	--	--

Clients Sample Numbers: LB-1 - LA5-20-02 Total Number Of Samples: 15

Relinquished By: [Signature]
 Received By: _____
 Relinquished By: _____
 Received By: _____

Date: 2/10/04 Time: 10:00 AM
 Date: _____ Time: _____
 Date: _____ Time: _____
 Date: _____ Time: _____

Attn.: Gil Bakshi
 ITI
 100 2nd Ave S #2005
 St. Petersburg, FL 33701

Tuesday, March 06, 2001

Ref Number: PS01910

POLARIZED LIGHT MICROSCOPY (PLM)

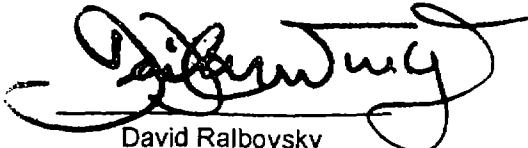
Performed by EPA 600/R-93/116 Method*

Project: QA samples

Sample	Location	Appearance	Sample Treatment	<u>ASBESTOS</u>		<u>NON-ASBESTOS</u>	
				%	Type	%	Fibrous % Non-Fibrous
TM-1	QA samples	Silver/Brown/Yellow Fibrous Homogeneous	Teased	None Detected		40% Cellulose 20% Glass	40% Other
LOS-64-09	QA samples	Brown/White Fibrous Homogeneous	Crushed/Dissolved	None Detected		5% Cellulose	65% Ca Carbonate 30% Other
LOS-64-10	QA samples	Brown/White Fibrous Homogeneous	Crushed/Teased	None Detected		20% Cellulose	60% Gypsum 20% Other

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples analyzed by ELAP 198.1 Method.


 David Ralbovsky
 Analyst


 Approved
 Signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. LA Testing suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval by LA Testing. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

Analysis performed by LA Testing, Inc. (NVLAP Air and Bulk #200232-0, State CA 2283, AZ AZ0921, TX 43369)

Attn: Gil Bakshi
 ITI
 100 2nd Ave S #2005
 St. Petersburg, FL 33701

Tuesday, March 06, 2001

Ref Number: PS01910

POLARIZED LIGHT MICROSCOPY (PLM)

Performed by EPA 600/R-93/116 Method*

Project: QA samples

Sample	Location	Appearance	Sample Treatment	<u>ASBESTOS</u>		<u>NON-ASBESTOS</u>	
				%	Type	% Fibrous	% Non-Fibrous
LOS-98-01	QA samples	Tan/Grey Non-Fibrous Homogeneous	Teased	None Detected		< 1% Synthetic	60% Ca Carbonate 40% Matrix
LOS-200-01	QA samples	Tan Fibrous Homogeneous	Teased	None Detected		80% Cellulose	20% Perlite
LOS-912-01	QA samples	Grey Fibrous Homogeneous	Teased	None Detected		50% Cellulose 35% Min Wool	15% Perlite
LOS-24-07	QA samples	Black/Silver Fibrous Homogeneous	Teased	None Detected		15% Glass	30% Matrix 55% Other
LOS-59-04	QA samples	White Non-Fibrous Homogeneous	Teased/Dissolved	None Detected		< 1% Cellulose	60% Ca Carbonate 40% Matrix
LOS-20-02	QA samples	White Non-Fibrous Homogeneous	Teased/Dissolved	None Detected		< 1% Cellulose	80% Ca Carbonate 20% Matrix

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples analyzed by ELAP 198.1 Method

Jeff Krogstad
 Analyst

Approved
 Signatory

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Analysis performed by LA Testing, Inc. (NVLAP Air and Bulk #200232-0, State CA 2283, AZ A20921, TX 43369)

Attn.: Gil Bakshi
 ITI
 100 2nd Ave S #2005
 St. Petersburg, FL 33701

Tuesday, March 06, 2001

Ref Number: PS01910

POLARIZED LIGHT MICROSCOPY (PLM)

Performed by EPA 600/R-93/116 Method*

Project: QA samples

Sample	Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS	
				%	Type	% Fibrous	% Non-Fibrous
LB-1	QA samples	White Fibrous Heterogeneous	Teased	None Detected		15% Cellulose	80% Gypsum 5% Matrix
VAL-100-2	QA samples	White Non-Fibrous Homogeneous	Teased/Dissolved	None Detected		< 1% Cellulose	15% Matrix 85% Ca Carbonate
SO-OMS-1	QA samples	White/Tan Fibrous Heterogeneous	Teased/Dissolved	None Detected		40% Cellulose	10% Ca Carbonate 20% Gypsum 30% Matrix
WLA-M-5	QA samples	Tan Fibrous Heterogeneous	Teased	3% Chrysotile		5% Cellulose	80% Ca Carbonate 12% Matrix
HP-M-5	QA samples	White Non-Fibrous Homogeneous	Teased/Dissolved	None Detected		None Detected	70% Ca Carbonate 30% Matrix
LOS-42-01	QA samples	White/Tan Fibrous Heterogeneous	Teased	None Detected		65% Cellulose	35% Matrix

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples

* NY samples analyzed by ELAP 198.1 Method.

Jeff Krogstad
 Analyst

Approved
 Signatory

Disclaimers: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. LA Testing suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval by LA Testing. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

Analysis performed by LA Testing, Inc. (NVLAP Air and Bulk #200232-0, State: CA 2283, AZ AZ0921, TX 43369)

145

[illegible]

159 Pasadena Ave
 South Pasadena, CA 91030
 Phone: (323) 254-9960 Fax: (323) 254-9982



Attn: Gil Bakshi

Friday, January 12, 2001

IMI

Ref Number: PS01145

100 2nd Ave S #2005
 St. Petersburg, FL 33701

POLARIZED LIGHT MICROSCOPY (PLM)

Performed by EPA 600/R-93/116 Method*

Project: QA Control Samples

Sample	Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS	
				%	Type	% Fibrous	% Non-Fibrous
PAS-217-1		White/Brown Fibrous Homogeneous	Teased	None Detected		80% Cellulose	20% Other
LOS-64-10		Brown/White Fibrous Homogeneous	Teased	None Detected		15% Cellulose	60% Gypsum 2% Ca Carbonate 23% Other
P-OMS-01		Brown Fibrous Homogeneous	Teased	None Detected		90% Cellulose	10% Other
BELL-1-1		White/Grey Fibrous Homogeneous	Teased	None Detected		50% Cellulose 15% Glass	35% Perlite
S-MAIN-2		Gray Non-Fibrous Homogeneous	Crushed/Dissolved	< 1% Chrysotile		5% Other	85% Ca Carbonate 10% Other
LOS-42-05		White/Brown Fibrous Heterogeneous	Teased	None Detected		80% Cellulose	20% Matrix

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples analyzed by ELAP 198.1 Method

David Raibovsky
 Analyst

Approved
 Signatory

Disclaimer: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. LA Testing suggests that samples reported as <1% or none detected be tested with either SEM or TEM. The above test report relates only to the tests tested. This report may not be reproduced, except in full, without written approval by LA Testing. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

Analysis performed by LA Testing, Inc. (NVLAP Air and Bulk #200232-0 State: CA 2283 AZ A20921, TX 42069)

159 Pasadena Ave
 South Pasadena, CA 91030
 Phone: (323) 254-9960 Fax: (323) 254-9982



Attn.: Gil Bakshi
 ITI
 100 2nd Ave S #2005
 St. Petersburg, FL 33701

Friday, January 12, 2001

Ref Number PS01145

POLARIZED LIGHT MICROSCOPY (PLM)

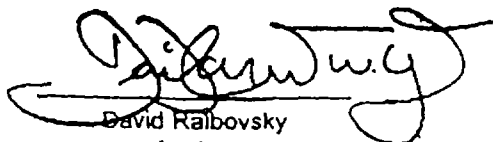
Performed by EPA 600/R-93/116 Method*

Project: QA Control Samples

Sample	Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS	
				%	Type	% Fibrous	% Non-Fibrous
LOS-273-01		White Non-Fibrous Homogeneous	Teased	None Detected		< 1% Glass 5% Other	95% Gypsum
LOS-24-04		White Fibrous Heterogeneous	Teased	None Detected		5% Cellulose < 1% Glass 2% Other	93% Gypsum
LOS-58-01		Black Fibrous Heterogeneous	Teased	None Detected		80% Cellulose	20% Other
LOS-20-02		White Non-Fibrous Homogeneous	Teased	None Detected		None Detected	30% Ca Carbonate 70% Matrix

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples, each component is analyzed separately. Also, "N of Layers" refers to number of separable subsamples.

* NY samples analyzed by ELAP 198.1 Method.


 David Ralbovsky
 Analyst

Approved
 Signatory

Disclaimer: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. LA Testing suggests that samples reported as < 1% or none detected be tested with either SEM or TEM. The above test report relates only to the items tested. This report may not be reproduced except in full, without written approval by LA Testing. The above test must not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

Analysis performed by LA Testing, Inc. (NVLAP Air and Bulk #200232-G, State CA 2283, AZ AZ0921, TX 43369)

159 Pasadena Ave
 South Pasadena, CA 91030
 Phone: (323) 254-9960 Fax: (323) 254-9982



Attn: Gil Bakshi
 ITI
 100 2nd Ave S #2005
 St Petersburg, FL 33701

Thursday January 11, 2001

Ref Number: PS01148

POLARIZED LIGHT MICROSCOPY (PLM)

Performed by EPA 600/R-93/116 Method*

Project: QA Control Samples

Sample	Location	Appearance	Sample Treatment	ASBESTOS		NON-ASBESTOS		
				%	Type	%	Fibrous	% Non-Fibrous
BAK-MAIN-8		White Non-Fibrous Homogeneous	Crushed/Dissolved	None Detected		5% Cellulose		60% Ca Carbonate 35% Other
SB-MAIN-01		Brown/Grey Fibrous Homogeneous	Teased	None Detected		80% Cellulose		20% Other
VN-251-5		Grey Non-Fibrous Homogeneous	Crushed/Dissolved	None Detected		None Detected		30% Ca Carbonate 70% Other

Comments: For all obviously heterogeneous samples easily separated into subsamples, and for layered samples each component is analyzed separately. Also, "# of Layers" refers to number of separable subsamples.

* NY samples analyzed by ELAP 198.1 Method

David Rainowsky
 Analyst

Approved
 Signatory

Disclosures: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed. LA Testing suggests that samples reported as 4% or none detected be tested with either SEM or TEM. The above test report refers only to the sample tested. This report may not be reproduced, except in full, without written approval by LA Testing. The above test results may be used by the client to claim product endorsement by NYS/LAP, no other agency of the United States Government. Laboratory is not responsible for the accuracy of results when requested to physically separate and analyze layered samples.

Analysis performed by LA Testing, Inc. (NYS/LAP) and Bulk #202232-0 State CA 2283, AZ 420921 TX 43269

APPENDIX B

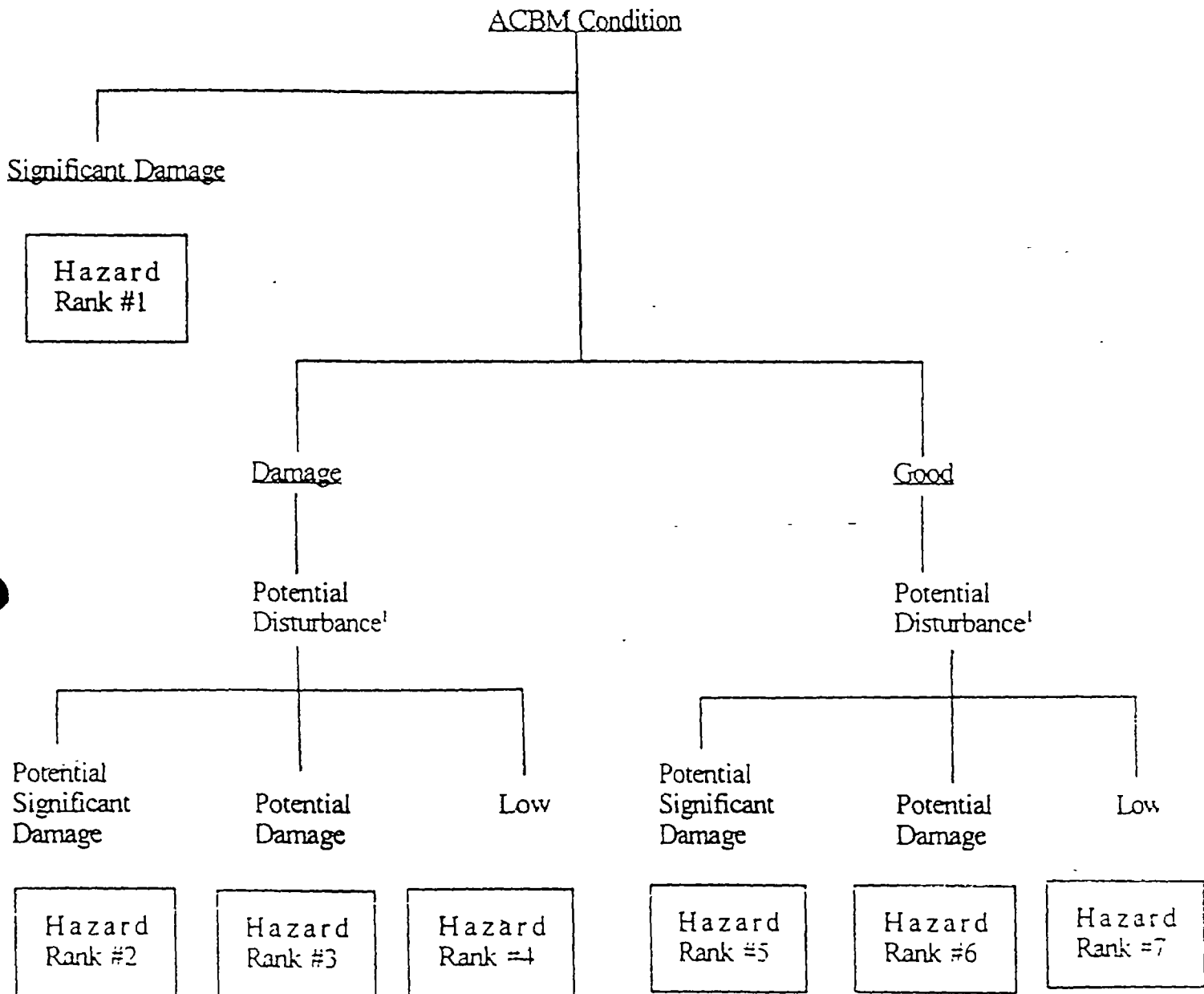
CLASSIFICATIONS FOR HAZARD POTENTIAL
(TABULAR DISPLAY)

Hazard Rank	ACBM Condition	ACBM Disturbance Potential
1	Significantly Damaged	Any
2	Damaged	Potential for Significant Damage
3	Damaged	Potential for Damage
4	Damaged	Low
5	Good	Potential for Significant Damage
6	Good	Potential for Damage
7	Good	Low

APPENDIX C

APPENDIX C

CLASSIFICATIONS FOR HAZARD POTENTIAL



APPENDIX D

RESPONSE ACTIONS BASED ON HAZARD RANKING

Hazard Rank	Removal Priority	AHERA Categories	Response Actions Required by AHERA
1	1	Significantly Damaged	Evacuate or isolate the area if needed. Remove the ACBM (or enclose or encapsulate if sufficient to contain fibers). Repair of thermal system insulation is allowed if feasible and safe. O&M required for all friable ACBM.
2	2	Damaged - Potential for Significant Damage	Evacuate or isolate the area if needed. Remove, enclose, encapsulate, or repair to correct damage. Take steps to reduce potential for disturbance. O&M required for all friable ACBM.
3	3	Damaged - Potential for Damage	Remove, enclose, encapsulate, or repair to correct damage. O&M required for all friable ACBM.
4	4	Damaged	Same as hazard rank 3.
5	5	Potential for Significant Damage	Take steps to reduce potential for disturbance. O&M required for all friable ACBM and TSI.
6	6	Potential for Damage	O&M required for all friable ACBM and TSI.
7	7	All Remaining ACBM	O&M required for all friable ACBM but measures need not be as extensive as above.

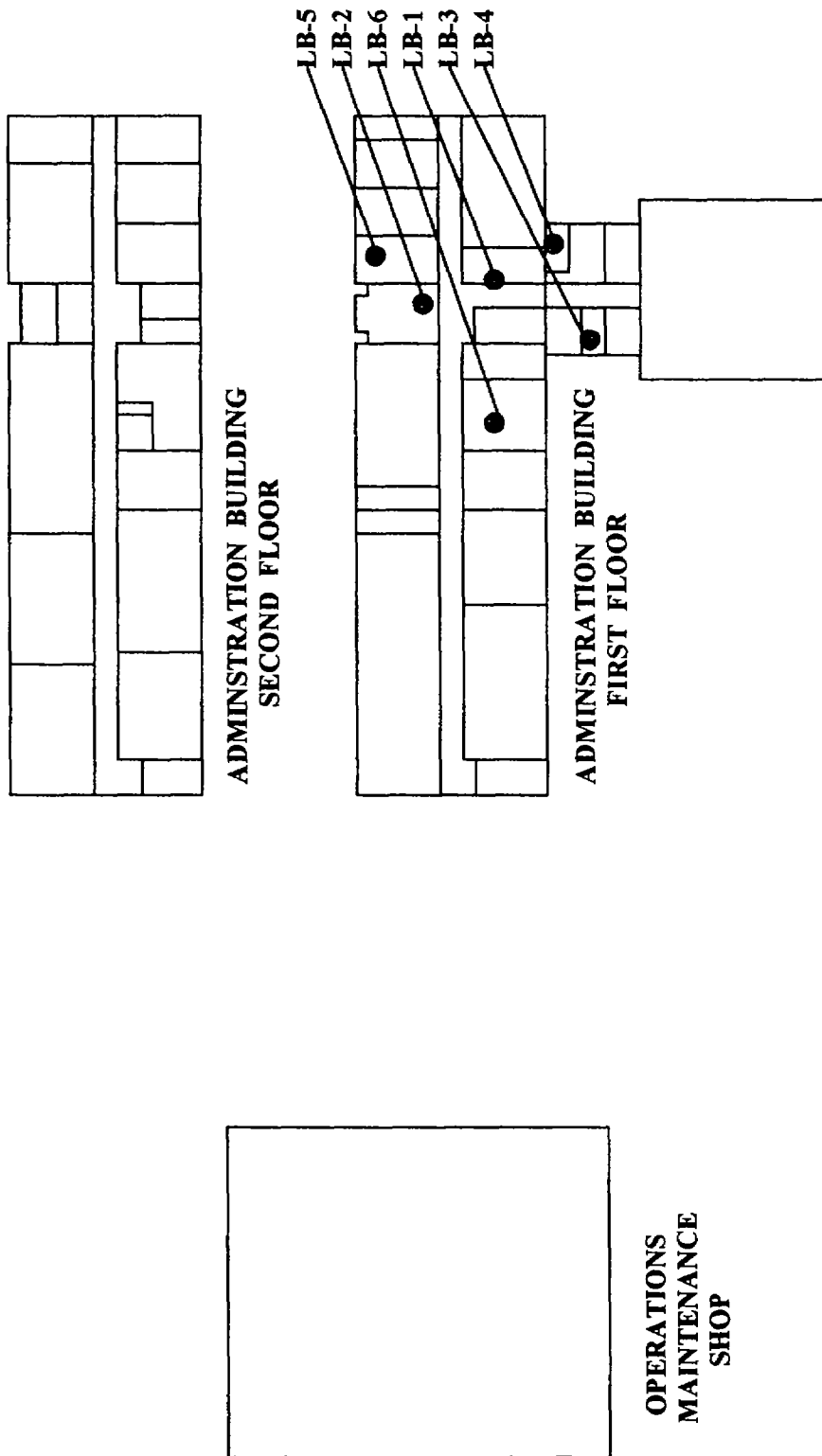
Note: AHERA does not account for combinations of current and potential damage (i.e., hazard ranks #2 and #3). The response actions shown are combinations of those required for each condition.

APPENDIX E



Explanation

- Bulk Sample Location
- Roof Sample Location



ITI of South Florida
Environmental Services
Drawn: GB 12/15/2000

Asbestos Survey
U.S. Army Reserve Center
Long Beach, California

ITI OF SOUTH FLORIDA, INC.

ASBESTOS BULK SAMPLE ASSESSMENT FORM

Sample Number. LB-1, LB-2

Sample Date. 9/21/00

Building: May A

Sample Description: Joint Compound

Homogeneous Area Number. 1

Material Type: ☐ Surfacing ☐ Thermal System Insulation ☒ Miscellaneous

Asbestos Containing Material: ☐ Positive ☐ Assumed

Percent Asbestos: _____ % ☐ Trace ☒ None Detected

QA/QC Sample ☒ Yes ☐ No If yes, Sample Number LB-1

☐ Friable ☐ Non Friable Category 1 ☐ Non Friable Category 2

Assessment Condition: ☐ Good ☐ Fair ☐ Poor

Percent Damage: ☐ 0% ☐ 0-10% ☐ 10-25% ☐ >25%

Extent of Damage: ☐ Localized ☐ Distributed

Type of Damage: ☐ Deterioration ☐ Water ☐ Physical ☐ Scrapes
☐ Gouges ☐ Cracks ☐ Stains ☐ Flaking
☐ Marred Surface ☐ Broken Up

Potential for Disturbance: ☐ High ☐ Moderate ☐ Low

Type of Damage: ☐ Contact ☐ Vibration ☐ Erosion ☐ Deterioration
☐ Occupant ☐ Maintenance ☐ Waste ☐ Demolition
☐ Mechanical

Building Inspection Assessment 1 2 3 4 5 6 7

Hazard Ranking: 1 2 3 4 5 6 7

Removal Priority: 1 2 3 4 5 6 7

ITI OF SOUTH FLORIDA, INC.

ASBESTOS BULK SAMPLE ASSESSMENT FORM

Sample Number. LB-3

Sample Date. 9/21/00

Building: Main

Sample Description: Joint Compound

Homogeneous Area Number. 1

Material Type: ☐ Surfacing ☐ Thermal System Insulation ☒ Miscellaneous

Asbestos Containing Material: ☒ Positive ☐ Assumed

Percent Asbestos: 2 % ☐ Trace ☐ None Detected

QA/QC Sample ☐ Yes ☒ No If yes, Sample Number _____

☒ Friable ☐ Non Friable Category 1 ☐ Non Friable Category 2

Assessment Condition: ☒ Good ☐ Fair ☐ Poor

Percent Damage: ☐ 0% ☒ 0-10% ☐ 10-25% ☐ >25%

Extent of Damage: ☐ Localized ☒ Distributed

Type of Damage: ☐ Deterioration ☐ Water ☒ Physical ☐ Scrapes

☐ Gouges ☐ Cracks ☐ Stains ☐ Flaking

☐ Marred Surface ☐ Broken Up

Potential for Disturbance: ☐ High ☐ Moderate ☒ Low

Type of Damage: ☐ Contact ☐ Vibration ☐ Erosion ☐ Deterioration

☐ Occupant ☐ Maintenance ☐ Waste ☐ Demolition

☐ Mechanical

Building Inspection Assessment	1	2	3	4	5	6	<u>7</u>
Hazard Ranking:	1	2	3	4	5	<u>6</u>	7
Removal Priority:	1	2	3	4	5	<u>6</u>	7

ITI OF SOUTH FLORIDA, INC.

ASBESTOS BULK SAMPLE ASSESSMENT FORM

Sample Number. LB-4, LB-5, LB-6

Sample Date. 9/21/00

Building: main

Sample Description: Pipe wrap

Homogeneous Area Number. 2

Material Type: ☐ Surfacing ☒ Thermal System Insulation ☐ Miscellaneous

Asbestos Containing Material: ☐ Positive ☐ Assumed

Percent Asbestos: _____% ☐ Trace ☒ None Detected

QA/QC Sample ☐ Yes ☐ No If yes, Sample Number _____

☐ Friable ☐ Non Friable Category 1 ☐ Non Friable Category 2

Assessment Condition: ☐ Good ☐ Fair ☐ Poor

Percent Damage: ☐ 0% ☐ 0-10% ☐ 10-25% ☐ >25%

Extent of Damage: ☐ Localized ☐ Distributed

Type of Damage: ☐ Deterioration ☐ Water ☐ Physical ☐ Scrapes
☐ Gouges ☐ Cracks ☐ Stains ☐ Flaking
☐ Marred Surface ☐ Broken Up

Potential for Disturbance: ☐ High ☐ Moderate ☐ Low

Type of Damage: ☐ Contact ☐ Vibration ☐ Erosion ☐ Deterioration
☐ Occupant ☐ Maintenance ☐ Waste ☐ Demolition
☐ Mechanical

Building Inspection Assessment 1 2 3 4 5 6 7

Hazard Ranking: 1 2 3 4 5 6 7

Removal Priority: 1 2 3 4 5 6 7

APPENDIX F

Division of Security

Certified Site Surveillance Technician

Timothy F Caughey



90-2831

10/18/2001

Certified Asbestos Consultant

Gil Bakshi



99-2650

10/15/2001

INTERNATIONAL TRAINING INSTITUTE OF SOUTH FLORIDA, INC.
ASBESTOS BUILDING INSPECTOR TRAINING

CERTIFIES THAT

GIL BAKSHI

HAS SUCCESSFULLY COMPLETED REQUIREMENTS FOR THE

ASBESTOS BUILDING INSPECTOR REFRESHING

4 HOURS

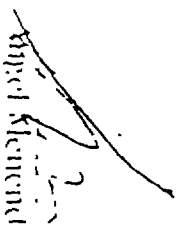
TESTING SUCCESSFULLY COMPLETED THE REQUIRED TRAINING FOR ASBESTOS AGGREGATION
(ENR136A1111)

CONDUCTED

APRIL 17, 2000

BY INTERNATIONAL TRAINING INSTITUTE OF SOUTH FLORIDA, INC.
100 2ND AVENUE, SUITE 100, FT. LAUDERDALE, FLORIDA 33304
754 898 0862

Certificate No. 7282A
CAI PROJECTS ARJID: 0.5
Issued Date: 04/17/00
Expiration Date: 04/17/01
To: Bill & Curran No. 202-604-4240


Angel Mendez, Director

INTERNATIONAL TRAINING INSTITUTE OF SOUTH AFRICA, INC.
ASBESTOS MANAGEMENT PLANNER TRAINING

CERTIFIES THAT

GIL BAKSHI

HAS SUCCESSFULLY COMPLETED REQUIREMENTS FOR THE

ASBESTOS MANAGEMENT PLANNER REFRESHER

4 HOURS

HAS SUCCESSFULLY COMPLETED THE REQUIREMENT TRAINING FOR ASBESTOS MANAGEMENT
EXPIRATION DATE 11/11/11

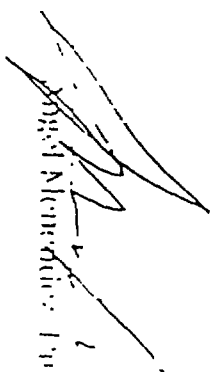
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APRIL 17, 2009

BY INTERNATIONAL TRAINING INSTITUTE OF SOUTH AFRICA, INC.

100 2ND AVENUE SOUTH AFRICA, SOUTH AFRICA
Tel: 0027 21 400 0000

Certificate No. 7282B
MPE RNTS (AMH) 0.5
Associated No. 04/17/00
Expiration Date: 04/17/01
Social Security No. 202-00-1-10


Robert M. Mendenhall, President

APPENDIX G

STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to



to conduct analyses of environmental samples as specified in the
"List of Approved Fields of Testing and Analytes"
which accompanies this Certificate.

This Certificate is granted in accordance with provisions of Section 1010, et seq
(New Section 100825) of the Health and Safety Code.

Certificate No. 2283

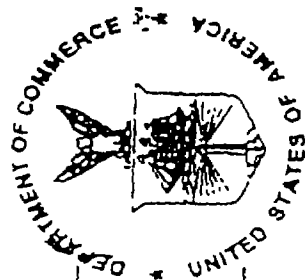
Expiration Date 12/31/2001

Issued on: 12/01/1999
at Berkeley, California.
subject to forfeiture or revocation

George C. Kulasingam, Ph.D.
Manager
Environmental Laboratory Accreditation Program

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]



ISO/IEC GUIDE 25 1990
ISO 9002 1987

Certificate of Accreditation

IA TESTING
S. PASADENA, CA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

BULK ASBESTOS FIBER ANALYSIS

June 30, 2001

Effective through

David E. Alderman
for the National Institute of Standards and Technology

NVLAP Lab Code: 200232-0

APPENDIX H

REGULATIONS

US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION ASBESTOS STANDARDS

29 CFR 1910.1001	General Industry
29 CFR 1926.1101	Construction Industry
29 CFR 1910.134	Use of Respirators (General)

The construction industry standard covers employees engaged in demolition and construction, and the following related activities likely to involve asbestos exposure (not a complete list)

- Removal
- Encapsulation
- Alteration
- Repair
- Maintenance
- Insulation
- Spill / Emergency clean-up
- Transportation
- Disposal
- Storage of ACM

US EPA NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

- Bans on Asbestos Containing Material
- Definitions
- Analytical Methods
- Notification
- Waste Disposal

US EPA ASBESTOS HAZARD EMERGENCY RESPONSE ACT

- Identifying ACM
- Evaluating ACM
- Controlling ACM in schools
- Training

US EPA ASBESTOS SCHOOL HAZARD ABATEMENT REAUTHORIZATION ACT

- Extended accreditation requirements to public and commercial buildings for persons who inspect for asbestos containing material, design response actions, or carry out response actions
- Increased the minimum number of training hours, including additional hand-on training, required for accreditation of workers and supervisors performing work in schools and / or public and commercial buildings

Asbestos Information

The following information is from the DOSH HomePage as of January 2001

1. What are the specific occupational regulations for asbestos construction work?

Asbestos-in-Construction-Title 8 of the California Code of Regulations (8 CCR) 1529 at www.dir.ca.gov/Title8/sb4a4.html. See 8 CCR 5208 for general industry and 8 CCR 8359 for shipyard rules at www.dir.ca.gov/samples/search/query.htm and search for these codes.

Federal OSHA asbestos compliance directives and interpretations- Go to www.osha-slc.gov/SLTC/asbestos/index.html#Compliance
Cal/OSHA asbestos contractor registration- Go to Asbestos Registration.
Cal/OSHA asbestos consultant certification- See 8 CCR 341.15, www.dir.ca.gov/title8/ch3_2sb2a2_6.html 1529(q) and the Business and Professions Code Sections 7180-7189.7 at www.leginfo.ca.gov/calaw.html
Cal/OSHA asbestos training provider certification - See 8 CCR 341.16 at www.dir.ca.gov/title8/ch3_2sb2a2_7.html and 1529 (k) (B)

2. Where is asbestos found?

The use of asbestos is much more limited today than in the past, but many buildings still have construction materials that contain it. Contact the U.S. EPA for a list of such materials, for clarification on the asbestos bans (click on "Helpful Information") and other information. U.S. EPA Region 5 has a short explanation of the ban.

Note: The California Business & Professions Code 7180(b) allows Contractors with AHERA-certified asbestos inspector training to take up to 12 samples in residential dwellings for bid preparation, employee health and safety or contract completion purposes. Be aware only a Cal/OSHA-Certified Asbestos Consultant (see below) can interpret the results and provide a full range of asbestos consulting services.

3. How can those involved in planning asbestos removal work obtain help?

Anyone thinking about removing asbestos may want to contact a Cal/OSHA-Certified Asbestos Consultant. Only a Cal/OSHA-Certified Asbestos Consultant (CAC) can provide asbestos consulting (as defined by the Business and Professions Code, 7180-7189.7, and triggered by the same size and concentration triggers as for registered contractors). These services include building inspection, abatement project design, contract administration, supervision of site surveillance technicians, sample collection, preparation of asbestos management plans, and clearance air monitoring.

Note: The Business and Professions Code sections 7180(b)(3) and 7187 prohibit:

Contractors from providing professional health and safety services or performing any asbestos risk assessment, including clearance air monitoring

Consultants and site surveillance technicians from having any financial or proprietary interest in an asbestos abatement contractor hired for the same project

For general information, you can call the nearest Cal/OSHA Consultation Office or the Asbestos Contractor Registration and Consultant Certification Units of Cal/OSHA. See "Resources" for contact information.

4. How does one choose an asbestos contractor?

Cal/OSHA does not recommend specific asbestos removal contractors. For general guidance on choosing a contractor, see the Contractor's State License Board 10 Tips and other guides at www.cslb.ca.gov A Cal/OSHA-Certified Asbestos Consultant may help this process. In choosing a contractor, you may want to consider a contractor's experience, work plan, proof of training and other documentation, and compliance history. See the Cal/OSHA and U.S. EPA compliance history database www.osha.gov/oshstats/ and esceev.sdc-moses.com/oeca/oc/nars/. Note: the U.S. EPA database will not include all violations issued by local air quality districts. You can also contact them directly.

5. What if there is a problem at an asbestos worksite?

The Asbestos Contractor Registration Unit does not perform on-site inspections in response to complaints concerning specific worksites. Job-specific complaints are best dealt with as follows:

Unsafe or unhealthy working conditions - Call the nearest Cal/OSHA District Enforcement Office. Look in your local phone directory under State Government, Department of Industrial Relations, Division of Occupational Safety and Health or go to http://www.dir.ca.gov/DOSH/field_oper.html.

Environmental concerns- Contact the local air quality district, the State Air Resources Board or the U.S. EPA, Region 9. Look in your local phone directory under the name of your District or go to the State Air Resources Board web site at www.arb.ca.gov/capcoa/roster.htm and hit the "Contact Us" button to find the "Local Air District Contact List." The State Air Resources Board has a complaint hotline at 1-800-272-4572. Call the U.S. EPA at (415) 744-1089 for asbestos questions.

Contract disputes or licensing violations- Contact the Contractors State License Board at 1-800-321-2752. For information on their process, go to www.cslb.ca.gov

Wage and hours of work issues- Contact the nearest local office of the Division of Labor Standards Enforcement by looking in your phone book under "State Government, Department of Industrial Relations."

If you do call us directly, we will discuss your concerns. The ACRU does review the results of investigations by Cal/OSHA Enforcement and other agencies. We may take separate administrative action, particularly if registrants display a pattern of non-compliance with asbestos and related laws and regulations.

6. What are some informational obligations of building owners, contractors and other employers?

The following is a summary of the major asbestos notification and information requirements in 8 CCR 1529, 5203, 341.6-341.14 and the California Health & Safety Code. See the codes for the complete requirements. Note: Employers also have additional informational duties towards their employees under 8 CCR 1529, 1509 or 3203 (the Injury and Illness Prevention Program requirements for construction and general industry), 3204 (Access to Employee Exposure and Medical Records), as well as other Title 8 regulations.

Employers performing work subject to 8 CCR 1529:

If less than 100 sq.ft. of asbestos-containing construction materials and therefore not subject to the asbestos registration rules, file a Report of Use with the Chief of DOSH (Cal/OSHA)

Determine the location and quantity of asbestos-containing material (ACM) and/or presumed ACM (PACM) based on the criteria in 1529(k)(1); {ref. 1529(k)(3)(A)}

If at a temporary worksite, notify the nearest Cal/OSHA District Enforcement Office 24 hours prior to work {ref. 1529(r) & 5203}
Any incident resulting an employee exposure in excess of the PEL and/or excursion limit by reporting in writing to the Chief of DOSH within 15 days. {ref. 1529(r) & 5203}

Through meetings or other methods, inform employees, building owner and other employers on site, prior to work, about the location and quantity of ACM and/or PACM, the nature of their work, requirements pertaining to regulated areas, as well as the means to prevent asbestos air contamination; and {ref. 1529(d)(1) & (k)(3)(B)}

Post a warning sign outside the regulated area that is understandable to employees working in and contiguous to the area {ref. 1529(e)(2) and (k)(7)}
As soon as possible, notify affected employees regarding the results of personal air monitoring {ref. 1529(f)(5)}

Within 10 days of completing the work, regarding the location and quantity of remaining asbestos, as well as any final monitoring results {ref. 1529(k)(3)(C)}

See 8 CCR 1529 for the exact requirements. There are additional notification duties to the local air quality district or the U.S.EPA.

Employers performing work subject to 8 CCR Article 2.5 Registration

Asbestos-Related Work:

Send notices of temporary worksites to the nearest Cal/OSHA District Office 24 hours prior to the start of each job (ref. 341.9)

Hold a pre-job safety meeting to discuss safety program and safe work practices with employees, their representatives, and the building owner or their representative (for work covered by asbestos registration) (ref. 341.11)

Post a warning sign readable at 20 feet (ref. 341.10(a); see also 1529(e)(2) and (k)(7) for similar and additional requirements)

Before the commencement of the work, provide a copy of the registration to the prime contractor and other employers at the site. Also, post a copy beside the Cal/OSHA poster. (ref. 341.10(b))

See 8 CCR, Article 2.5, for the exact requirements.

Building Owners:

Prior to beginning work, determine the location and quantity of ACM and/or PACM based on the criteria in 1529(k)(1); (ref. 1529(k)(2)(A))

Notify in writing or by personal communication the following or their authorized representatives: (ref. 1529(k)(2)(B))

Prospective employers applying or bidding for work and all other employers with employees who will work in or adjacent to areas with such material

The building owner's employees working in or adjacent to these areas; and Tenants who will occupy areas containing such material

If they are owners of public and commercial buildings constructed prior to 1979 and know that the building contains asbestos-containing construction materials, provide information to all occupants. For more details view the regulations of the Health & Safety Code, Division 20, Chapter 10.4 Asbestos Notification, 25915-25919.7 at www.legend.ca.gov/calaw.html This code is enforced by city or county jurisdictions, not Cal/OSHA.

If a school district, are required by the U.S. EPA to have a management plan and surveys of where asbestos is known or presumed to be present. Contact the U.S. EPA Region 9 Asbestos Regional Coordinator for information.

All Employers:

Ascertain on a daily basis, the integrity of enclosures and or the effectiveness of other control methods used in regulated areas their employees are working adjacent to. (ref. 1529(d)(4))

If they discover their employees are exposed to asbestos they must protect them by, for example, removal from the area or performing an initial exposure assessment. ref. 1529(k)(4))

If they discover ACM or PACM they must inform the building owner and other employers of employees working at the work site within 24 hours (ref. 1529(k)(4))

In cases when material they reasonably believe to be asbestos has not been rendered harmless, to stop work in affected areas. See section 25914.2(c) of the California Health and Safety Code for the exact requirements.

General Contractors:

Ascertain whether the asbestos contractor is in compliance with 8 CCR section 1529(d)(5) and require them to come into compliance when necessary

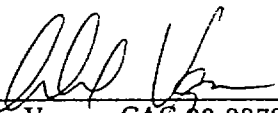
APPENDIX I

**Asbestos Survey
Long Beach U.S. Army Reserve Center
Long Beach, California
Contract DACA05-92-D-0036
Delivery Order 14
Modification 1**

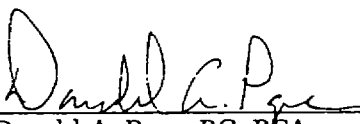
Prepared for

Department of the Army
Corps of Engineers, Sacramento District
CESPK-ED-E
1325 J Street
Sacramento, California 95814

HLA Project No. 30261 002232



Alex Vargas, CAC 92-0870
Project Environmental Scientist



Donald A. Pape, RG, REA
Principal Hydrogeologist

March 5, 1996



Harding Lawson Associates
Engineering and Environmental Services
30 Corporate Park, Suite 400
Irvine, California 92714 - (714) 260-1800

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DISTRIBUTION

EXECUTIVE SUMMARY

The Department of the Army, Corps of Engineers, Sacramento District, retained Harding Lawson Associates (HLA) to:

- Perform an asbestos update survey to identify suspect asbestos-containing materials (ACM) in the buildings at the Long Beach U.S. Army Reserve Center (USARC), Long Beach, California
- Collect bulk samples of suspect materials
- Document the physical condition, friability, and location of suspect materials
- Submit samples to a laboratory for analysis of their asbestos content
- Prepare a report of findings, conclusions, and recommendations

The survey was conducted on August 21, 1995 by a Certified Asbestos Consultant accredited by the State of California. Destructive survey techniques were not used. Accessible suspect asbestos-containing building materials including thermal system insulation were visually identified and evaluated. The scope of work under which the project was performed is further described in the HLA Work Plan dated March 29, 1995.

Based on the review of a previous asbestos survey report prepared in August 1988 by IT Corporation (IT) and HLA's survey of the buildings, HLA has concluded that the

following materials in the Long Beach USARC administration building contain asbestos:

- 12- by 12-inch white mottled floor tile mastic (mastic only)
- Gray roofing penetration mastic
- Transite asbestos cement flue pipe

ACM was not discovered in the accessible areas of the operations maintenance shop (OMS) building.

IT's asbestos survey report is presented as Appendix B. Confirmed ACM throughout the facility was in overall good condition at the time of the survey. An operations and maintenance program that includes a mechanism for occupant notification and periodic monitoring will help maintain these materials in good condition. HLA recommends that all future activities that could disturb the ACM, including salvage operations, renovation, and demolition, be performed by properly trained personnel. These activities should employ state-of-the-art techniques and be performed in accordance with all local, state, and federal laws and regulations.

Cost estimates for removal of confirmed ACM from the buildings are discussed in Section 7.0 and presented in Appendix E. The total cost estimate for removal of all confirmed ACM within the facility is \$30,072.

1.0 INTRODUCTION

This report presents the results of Harding Lawson Associates' (HLA) building survey update for asbestos-containing material (ACM) at the Long Beach U.S. Army Reserve Center (USARC), Long Beach, California. This work was performed for the Department of the Army, Corps of Engineers (COE), Sacramento District, pursuant to Contract DACA05-92-D-0036, Delivery Order 14, Modification 1, and the scope of work dated September 22, 1994, revised February 15, April 6, and June 13, 1995. The purpose of HLA's work was to evaluate the presence, extent, and condition of previously unidentified ACM in designated buildings and update previous asbestos survey reports to enable USARC to properly manage ACM in buildings.

The survey was performed on August 21, 1995, by HLA Environmental Scientist Alex Vargas. Mr. Vargas is a state of California Certified Asbestos Consultant (CAC No. 92-0870).

The procedures HLA used to perform building surveys for ACM at 21 USARCs in southern California were presented in the Work Plan dated March 29, 1995 and the Site Safety and Health Plan (SSHP) dated June 20, 1995.

The scope of work included:

- Conducting a building survey to:
 - Identify materials suspected of containing asbestos
 - Assess the condition of ACM
 - Quantify ACM for cost estimating purposes
 - Identify any imminent health hazards
- Collecting additional bulk samples of suspect materials as necessary to supplement the previous survey
- Submitting samples to a qualified laboratory for analysis
- Submitting quality assurance/quality control (QA/QC) samples to a secondary laboratory
- Preparing single-line floor plans to indicate sample locations, and results and locations of ACM
- Preparing and submitting an asbestos survey report for each building and/or installation that describes HLA's findings and recommendations.
- Preparing various planning documents and providing required submittals to the COE

2.0 ASBESTOS

2.1 General Description

Asbestos is a mineral that can be processed into very fine, virtually indestructible fibers and then incorporated into a wide variety of materials. Because asbestos has great tensile strength, high resistance to corrosion, low electrical conductivity, and a low capacity to conduct heat, it was widely used as thermal insulation. When added to materials such as ceiling and wall textures, roofing material, floor coverings, and brake linings, asbestos improves material cohesion, resistance to deterioration, and acoustic insulating properties.

Of the many fibrous mineral species, six are regulated by the U.S. government: chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite. Chrysotile is native to North America and belongs to the mineral family of serpentines, which tend to be long and curly. The other five types of fibrous minerals belong to the amphibole family, which tend to be shorter and very straight. Of the amphiboles, amosite and crocidolite are most commonly found in building materials.

2.2 Health Effects

Asbestos can be dangerous when inhaled, for precisely the same reasons it has been a valuable resource. Instead of dissolving or breaking up when they contact human tissue, asbestos fibers accumulate in the body, damaging cells and disrupting metabolic processes. Asbestos doses are *cumulative*; that is, small doses add up over time to make a large dose. The risk of developing an asbestos-related disease is thought to be linked

to an individual's cumulative dose. High cumulative doses carry a higher risk of disease; low cumulative doses are less likely to cause disease. For these reasons, asbestos-related diseases, such as the following, are primarily associated with prolonged occupational exposures.

Asbestosis: Occurs when damaged tissue is replaced by tough scar tissue. As scarring accumulates, the lungs stiffen and breathing becomes more difficult. This impaired breathing, known as asbestosis, is generally found in people who have had very great exposure to asbestos over a long period of time.

Lung Cancer: Occurs as asbestos fibers accumulate in the lungs where they rupture cells and damage tissue. As a result, the proteins that trigger cell division are released leading to uncontrolled growth of dividing cells. Growths that become malignant may develop into lung cancer. When combined with nicotine and other carcinogens, asbestos promotes cancerous growths: a smoker is up to 90 times more likely than a nonsmoker to develop lung cancer if also exposed to asbestos.

Mesothelioma: Occurs when asbestos fibers migrate to the tough membranes that are wrapped around the lungs and digestive tract. Cancer that grows in these membranes is always fatal. This cancer of the lung lining, mesothelioma, has been linked almost exclusively to asbestos exposure; additionally, this rare cancer seems to require relatively small doses of asbestos exposure.

3.0 REGULATORY FRAMEWORK

This section provides a summary of the federal and state regulations that apply to asbestos and asbestos-related work. The summary is not intended to be comprehensive nor to define all regulatory requirements that may apply to USARC facilities that contain asbestos or to persons who perform asbestos-related work in these facilities.

3.1 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) regulates environmental exposures to asbestos through two major pieces of legislation: the National Emission Standards for Hazardous Air Pollutants (NESHAP) under the Clean Air Act and the Asbestos Hazard Emergency Response Act (AHERA) under the Toxic Substances Control Act.

NESHAP, Part 61 of Title 40 of the Code of Federal Regulations (CFR), establishes standards by which asbestos-related work must be performed in order to prevent asbestos from being released into the environment. Some of the requirements include:

- Inspecting for asbestos before commencing a demolition or renovation project
- Notifying the local NESHAP enforcement agency of all demolition work and asbestos abatement work
- Training asbestos workers
- Prohibiting visible emissions and requiring the use of wet methods, negative-pressure enclosures, labeling of waste, and proper handling methods from removal to disposal.

In Long Beach, California, the EPA has delegated NESHAP enforcement to the South Coast Air Quality Management District (SCAQMD).

AHERA, Part 763 of 40 CFR, requires schools to inspect for asbestos, prepare management plans, make notifications regarding the presence of asbestos, use air sampling to confirm proper asbestos removal, and use accredited personnel to perform asbestos-related activities. AHERA and subsequent related legislation established a nationwide program of training and certification required of asbestos professionals, including abatement contractors and workers, who perform work in schools. These requirements have been extended to include asbestos work performed in all public and private sector buildings.

3.2 Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) regulates occupational exposures to asbestos through the General Industry and Construction Industry asbestos standards (29 CFR 1910.1001 and 29 CFR 1926.1101) and the Respiratory Protection Standard (29 CFR 1910.134). These standards are designed to protect workers from asbestos exposure through a series of requirements based on exposures above the permissible exposure limit (PEL). These requirements include:

- Assuming that certain building materials contain asbestos and that buildings constructed prior to 1990 contain ACM
- Implementing medical surveillance, respiratory protection, and training programs that include medical examinations, provision of respiratory and personal protective equipment (PPE), and training of workers and supervisors
- Training persons who may be exposed to asbestos during their work
- Using specific types of respirators dependent on the asbestos concentrations being generated

- Using specialized work practices and equipment such as negative-pressure enclosures, wet methods, air filtration equipment, decontamination units, warning signs and labels, and waste containers
- Collecting and analyzing air samples to evaluate potential worker exposures
- Mandating contractor registration with and notification of asbestos work to the local OSHA enforcement agency.
- Notifying occupants before and after each project covered by the standard

In California, the Department of Occupational Safety and Health (DOSH) enforces the OSHA regulations under Section 1529 of Title 8 of the California Code of Regulations (CCR). DOSH also requires that asbestos consultants performing work in California be trained and certified.

3.3 Other Asbestos Regulations

Many other federal and state regulations that are designed to protect workers, building occupants, and consumers from exposures to hazardous materials also apply to asbestos, including hazard communication, hazardous waste operators and emergency responders, and safe workplace regulations. Several other agencies in California also regulate asbestos including:

- California Environmental Protection Agency - Cal/EPA regulates asbestos waste and requires manifests for transportation and disposal of hazardous asbestos waste (friable and contains greater than 1 percent asbestos). Cal/EPA also requires waste generators to obtain an identification number. Parts of the California Health and Safety Code require that occupants of buildings and consumers of certain products be notified of their contents and the health effects associated with exposures or consumption.
- Contractors State License Board - The CSLB requires that asbestos abatement contractors be licensed as general contractors and maintain an asbestos certification.
- State Board of Equalization - Generators of hazardous waste are required to obtain a tax identification number and pay tax on the amount by weight of waste disposed.
- California Highway Patrol / Department of Transportation - CHP requires that waste containers be properly labeled and that transporters be registered.

Other legislation regulating asbestos exposure in the workplace includes:

- California Health and Safety Code §25249 (Proposition 65) - Requires warnings to be given to individuals who enter a building known to contain asbestos, if such individuals are subject to an asbestos exposure and the building owner cannot demonstrate that a significant risk does not exist.
- California Health and Safety Code §25915 et seq. (Connelly Bill) - Requires the owner of any building constructed prior to 1979, who knows that the building contains asbestos-containing construction materials (ACCM), to provide notice to all occupants of that building of the presence and location of known ACCM. Building owners are required to give this notice within 15 days of receipt of knowledge that asbestos exists within the building.

4.0 SURVEY SAMPLING, ASSESSMENT, AND ANALYTICAL PROCEDURES

HLA reviewed relevant existing data and performed a visual survey to identify the types and locations of building materials known to contain or suspected of containing asbestos. HLA then quantified and assessed the condition of the materials as described in this section. After identifying homogeneous materials suspected to contain asbestos, HLA collected additional bulk samples as necessary to supplement previous sampling activities. These samples were submitted to qualified laboratories for analysis by polarized light microscopy (PLM). HLA also attempted to ascertain whether asbestos abatement activities had taken place in the buildings by interviewing personnel familiar with the buildings.

4.1 Survey Procedures

4.1.1 Review of Existing Relevant Data

HLA reviewed a previous asbestos survey report prepared for USARC by IT Corporation (IT), dated August 1988. Results of the IT survey report are summarized in Section 5.3.

4.1.2 Field Investigation

HLA used nondestructive inspection and sampling techniques and did not attempt to access areas that would place HLA personnel in hazardous or permit-required confined spaces. The field investigation began with an initial building walkthrough and identification of homogeneous building materials suspected of containing asbestos based on information gathered during data review regarding building layout, structural features, and mechanical and plumbing systems. HLA then performed the following tasks:

- Evaluated whether materials suspected of containing asbestos were present in the buildings

- Collected bulk samples as required to adequately characterize building materials
- Identified sample locations and locations of ACM on building drawings
- Quantified the amount of ACM where access allowed
- Assessed the condition of suspected and known ACM
- Photographed typical ACM and conditions.

4.2 Sampling Procedures

4.2.1 Identification of Homogeneous Sampling Areas

After identifying those surfacing, thermal system insulation (TSI), and miscellaneous materials suspected of containing asbestos, HLA grouped the materials into homogeneous sampling areas. A homogeneous sampling area includes building materials that are uniform in texture and color and appear identical in every other respect. If there was a reason to suspect that materials may have been installed at different times even though they appear uniform, they were assigned to separate homogeneous sampling areas.

4.2.2 Number of Samples

Table 4.2.2 was used to determine the number of samples to collect from each homogeneous area, as described in 40 CFR 763.86. Samples were collected only as necessary to characterize new suspect materials and to supplement and/or verify previous sampling results.

Table 4.2.2. Minimum Number of Samples Per Homogeneous Sampling Area

ACM Type	Size of Homogeneous Sampling Area	Minimum No. of Samples
Surfacing Materials	Less than or equal to 1,000 square feet (sf)	3
	Greater than 1,000 sf and less than 5,000 sf	5
	Greater than 5,000 sf	7
Thermal System Insulation	Areas not assumed to be ACM	3
	Patched area (<6 linear feet [lf] or < 6 sf)	1
Miscellaneous Material	Areas not assumed to contain ACM	3

4.2.3 Sample Collection Method

HLA collected bulk samples by wetting the suspect material with amended water and cutting or scraping it from its substrate using an appropriate sampling tool. Sampling tools were cleaned before and after each use to prevent cross contamination of samples. Each sample was assigned a unique number, placed in an airtight plastic container, and transported to the laboratory accompanied by chain-of-custody records. Sample locations were repaired using caulk, spray glue, or patching material, as needed, but were not always returned to their original condition.

The sample numbering scheme was as follows:

AV0821101

AV = Inspector's initials
0821 = Date of inspection
101 = Sample number

During the field investigation, sampling locations were recorded on floor plans.

4.2.4 Personal Air Monitoring Assessment

HLA personnel performed personal air monitoring during the initial stages of this project to sample for asbestos fiber exposure during sampling activities. HLA donned appropriate

PPE as necessary during the course of the survey. Laboratory analytical results of personal air samples indicate that fiber concentrations encountered during sampling activities were below the OSHA PEL of 0.1 fibers per cubic centimeter of air.

Personal air samples taken during the first 3 days of bulk sampling activities for the scope of work described in Section 1.0 enabled HLA to establish a negative exposure assessment (NEA) and eliminate personal air monitoring for the remainder of the project. Laboratory analytical results of the personal air samples indicating consistent airborne fiber levels well below the OSHA PEL are the basis for the NEA. These laboratory reports are kept in the HLA project file.

4.3 Assessment Methodology

ACM identified during the building survey was assessed according to the protocol described in EPA's *Guidance for Assessing and Managing Exposure to Asbestos in Buildings* (EPA 560/5-85-024, June 1985). The protocol evaluates the risk of exposure to airborne asbestos fibers by assessing the condition of each ACM and the potential for that ACM to be disturbed and generate fibers (see Appendix A). ACM was assessed according to each of the following factors:

- Friability: The ability of an ACM to be crushed, crumbled, or reduced to powder by

hand pressure when dry (and thus create airborne fibers) was rated as follows:

- Friable (F): ACM that can be crumbled, crushed, or reduced to powder by hand pressure alone
- Nonfriable, Category 1 (NF1): Asbestos-containing packings, gaskets, resilient floor coverings, asphalt roofing products, caulk, and mastics. These bituminous materials are assumed to remain nonfriable if demolition is performed using "normal" methods, but will become friable if severely weathered, sanded, or abraded
- Nonfriable, Category 2 (NF2): ACM, excluding Category 1 nonfriable ACM, that, when dry and in its present form, cannot be crumbled, pulverized, or reduced to powder by hand pressure; however, these materials may become friable during demolition activities. These products include Transite board, pipe and asbestos cement products, plaster, stucco, and most paint
- Condition: The condition of ACM, including severity and extent of damage, was classified into one of the following categories:
 - Significantly Damaged: ACM that is crumbled, blistered, gouged, marred, delaminated, or otherwise damaged either uniformly or locally over a substantial portion of its surface area
 - Damaged: ACM that is crumbled, blistered, gouged, marred, delaminated, or otherwise damaged either uniformly or locally over a small portion of its surface area
 - Good: ACM with very little or no damage

- Potential for Disturbance: The potential for disturbance of each ACM was evaluated with respect to the types and frequency of occupancy, whether the ACM was accessible to area occupants, and the influences of vibration and air erosion. Each was assigned a factor of low, moderate, or high based on the following:

Accessibility

- High:
- Service workers work in the vicinity of the material more than once per week
 - The material is in a public area, room, or office and easily accessible to building occupants
- Moderate:
- Service workers work in the vicinity of the material once per month to once per week
 - The material is moderately accessible and in a frequently occupied area
 - The material is easily accessible but is in an area that is not frequently occupied
- Low:
- Service workers work in the vicinity of the material less than once per month
 - The material is visible but not within reach of building occupants
 - The material is accessible but is in an area that is infrequently occupied

Vibration

- High:
- Loud motors or engines present (e.g., some fan rooms)

- Intrusive noises or easily sensed vibrations (e.g., major airports, a major highway)
- Moderate: • Motors or engines present but not obtrusive (e.g., ducts vibrating but no fan in the area)
- Occasional loud sounds (e.g., a music room)
- Low: • Little or no vibration

Air Stream

- High: • High velocity air (e.g., elevator shaft, fan room, fan units)
- Moderate: • Noticeable movement of air (e.g., air shaft, ventilator air stream, supply air grilles)
- Low: • Typical or no air movement
- Known or Suspected Causes of Damage: HLA attempted to evaluate the causes of damage with respect to response action recommendations (RAR) and potential preventive measures. Sources of damage such as humans, mechanical causes (vibration and air erosion), material and substrate failure (leaks and earthquakes), age, and weathering were identified.

A hazard ranking from 1 to 7 was assigned to each ACM based on the results of this assessment. A hazard ranking of 1 indicates a low potential for disturbance and exposure; a ranking of 7 indicates the greatest potential.

4.4 Response Action Recommendations

HLA's RAR and abatement priority for each ACM were based on the results of the assessment. Prioritization also has seven classifications: a priority 1 indicates that an ACM represents an immediate hazard and should be isolated and removed as soon as possible. Priority 7 indicates that an ACM represents little risk of exposure

and should be managed in place. RARs included one or more of the following:

- Operations and Maintenance (O&M) Program: Managing all ACM in accordance with a properly designed and implemented O&M program. An O&M program has three components:
 - Identification, training, and notification requirements designed to prevent inadvertent disturbance of ACM
 - Periodic surveillance of ACM to monitor its condition and modify the response actions or the program, as necessary
 - Procedures to repair damaged ACM, clean up debris, and respond to fiber releases in the event that ACM is damaged or dislodged
- Repair: Returning all damaged ACM to an undamaged or intact state through limited replacement and patching
- Encapsulation: Treating ACM with a liquid that, after proper application, surrounds or embeds asbestos fibers in an adhesive matrix designed to prevent fiber release
- Enclosure: Installing airtight barriers around the ACM to prevent further damage and exposure to occupants
- Removal: Stripping ACM from its substrate within a regulated area using trained abatement workers; properly containerizing and disposing of the waste in a landfill

Response actions are not only based on the assessment results, but also can be influenced by future use or plans for renovation or demolition as well as financial considerations.

4.5 Analytical Procedures

4.5.1 Analytical Method

Bulk samples were analyzed by PLM using EPA Method 600/M4-82-020 in accordance with

40 CFR 763, Subpart F, Appendix A (AHERA), by Forensic Analytical Specialties, Inc. (FASI), Rancho Dominguez, California. Bulk samples of suspected ACM were examined under a stereomicroscope to identify suspect fibers. A polarized light microscope equipped with a dispersion staining objective lens was used to determine which of the suspect fibers are asbestos. The various asbestos minerals were identified on the basis of their unique optical characteristics. Reported asbestos percentages were based on visual volume estimates.

4.5.2 Laboratory Analysis QA/QC Procedures

HLA performed QA/QC sampling at a rate of 5 percent of the total collected bulk samples, or a minimum of one sample. Samples were submitted to Micro Analytical Laboratories (MAL), Emeryville, California, for analysis. Analytical results for the QA/QC samples were compared to the results from the primary laboratory to evaluate the precision between the two sets of data. Table 8.0 presents a comparison of QA/QC analytical results.

5.0 FINDINGS

5.1 Installation Description and Use

The Long Beach USARC is located at 3800 East Willow Street in Long Beach, California. Two buildings are located within the facility: the administration building (Schroeder Hall) and the operation maintenance shop (OMS) building. The buildings are used primarily for administrative and light vehicle maintenance purposes.

5.2 Building Descriptions

The administration and OMS buildings are constructed of brick and mortar exterior walls with mainly concrete cinder block and drywall interior walls and a built-up asphalt and gravel composition roof. The administration building contains approximately 22,520 square feet of floor space and the OMS contains approximately 3,663 square feet.

5.3 Previous Asbestos Surveys

The 63rd ARCOM provided HLA with a report of a previous survey performed by IT in May 1988. HLA reviewed this survey report prior to visiting the site and referenced it to confirm findings of the initial visual survey performed by HLA. This survey report is presented as Appendix B and is summarized below.

5.3.1 Asbestos-Containing Materials

Materials identified as ACM in the IT report were not observed by HLA during the survey. Section 5.4 discusses previous abatement activities within the facility.

5.3.2 Non-Asbestos-Containing Materials

According to the IT asbestos survey report, asbestos was not detected in samples of the following materials within the Long Beach USARC:

Administration Building

- Hot water tank insulation
- Drywall

- 12- by 12-inch speckled beige floor tile
- Built-up asphalt and gravel composition roofing felt
- 12- by 12-inch acoustic pegboard tiles
- Pegboard wallboard

OMS Building

- Built-up asphalt and gravel composition roofing felt

According to the IT report, no bulk samples were collected within the OMS building during the previous survey.

5.4 Previous Abatement Activities

During the survey, HLA observed that the asbestos-containing pipe elbows and fittings within the administration building identified in the IT survey report had been replaced with fiberglass insulation. Transite asbestos cement wallboard in the mechanical room as identified in the IT report had also been replaced with drywall material. Facility personnel were not able to indicate when abatement activities had taken place nor has HLA discovered records of such activities.

5.5 Survey and Assessment Findings

As discussed in Section 5.3, HLA identified and assessed the building materials identified as ACM and non-ACM in the IT survey report and attempted to verify the condition and quantities of existing ACM. HLA collected additional bulk samples to supplement the IT survey and prepare a more comprehensive asbestos survey report, which addresses all accessible suspect ACM within the Long Beach USARC.

The roof area of the OMS building was not accessible at the time of HLA's survey and may contain ACM not identified in this or the previous report. The roof was observed by HLA to contain built-up asphalt composition roofing felt with gravel cover and may include potential ACM in the form of roofing penetration and

sealant mastics, roof flashing material, and Transite asbestos cement flue pipe.

Bulk sample summary sheets are presented in Appendix C. Analytical laboratory reports are presented in Appendix D. Bulk sample locations are presented on Plate 1. Results of HLA's bulk sampling activities and analysis at the Long Beach USARC are summarized below.

5.5.1 Asbestos-Containing Materials

Administration Building

- 12- by 12-inch white mottled floor tile mastic (mastic only):
Analytical results indicate that this material contains a trace amount of chrysotile asbestos as a composite sample. Asbestos was not detected in the floor tile and the mastic contains 1 to 25 percent chrysotile asbestos. Approximately 15,000 square feet of this material is located within the administration building. The material is nonfriable and was in good condition at the time of the survey. HLA has assigned this material a hazard ranking of 1 and an RAR of 7.
- Gray roofing mastic:
Analytical results indicate that this material contains 15 to 20 percent chrysotile asbestos. Approximately 20 square feet of this material is located on pipe penetrations and elsewhere on the roof area of the building. The material is nonfriable and was in good condition at the time of the survey. HLA has assigned this material a hazard ranking of 1 and an RAR of 7.

- Transite asbestos cement flue pipe:
HLA identified approximately 4 linear feet of this material on the roof area during the survey. Transite is a known ACM and should be assumed to contain greater than 5 percent asbestos. The material is nonfriable and was in good condition at the time of the survey. HLA has assigned this material a hazard ranking of 1 and an RAR of 7.

OMS Building

ACM was not discovered within the OMS building during the course of this survey.

5.5.2 Non-Asbestos-Containing Materials

Asbestos was not detected in samples of the following materials collected by HLA at the Long Beach USARC:

Administration Building

- Gray baseboard and associated mastic

OMS Building

Suspect ACM was not identified within this building during the survey, thus no bulk samples were collected. The roof area was not accessible at the time of the survey.

5.6 Imminent Health Hazards

No imminent health hazards were identified during the course of this survey.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the findings above, HLA has concluded:

- The following ACM is present in the Long Beach USARC administration building:
 - 12- by 12-inch white mottled floor tile mastic (mastic only)
 - Gray roofing penetration mastic
 - Transite asbestos cement flue pipe
- ACM was not discovered and no bulk samples were collected in the OMS building during this survey.
- The roof area of the OMS building was not accessible at the time of the survey and may contain unidentified ACM.
- TSI and Transite asbestos cement wallboard within the administration building as identified in the IT report were observed to have been replaced by non-ACM materials at the time of HLA's survey. TSI may remain in inaccessible areas of the building such as the ceiling plenum between the first and second floors.
- An imminent asbestos hazard was not present at the facility during the site visit.

Based on the review of IT's previous asbestos survey report and HLA's survey and assessment, and our understanding of the COE's objectives and applicable regulations, HLA recommends the following:

- **Develop and implement an O&M plan for all known and suspect ACM**

ACM in good or fair condition, not subject to renovation or demolition, may be repaired as needed and managed in place in accordance with a properly designed and implemented asbestos O&M program. The O&M plan sets forth the responsibilities of the Asbestos Coordinator, asbestos consultant, building occupants and employees, and contractors performing work where ACM is located and requires:

- Written permission from the Asbestos Coordinator before any person performs any construction, renovation, improvement, or like work in or to the buildings
- Permission to do work that, based upon the nature and scope of the work, will involve or potentially involve ACM. All asbestos-related work will require authorization by the Asbestos Coordinator and performance by an asbestos abatement contractor
- Strict compliance with all permit requirements and procedures supplied by the Asbestos Coordinator and all directions given by the Asbestos Coordinator
- Immediate reporting to the Asbestos Coordinator of any spills or other releases of ACM (including the presence of any debris that may contain asbestos), observed or suspected, so that the Asbestos Coordinator can respond as appropriate
- Installation of only nonhazardous, non-ACM (e.g., floor tiles, mastics, partitions) in the buildings
- Prohibiting untrained or unlicensed persons from engaging in work involving the disturbance (in any fashion) of any ACM described in this report
- Not cutting, breaking, drilling into, tearing, gouging, removing, or otherwise disturbing any ACM
- Use of wet, disposable cloths or towels to clean and not using excessive pressure
- Not touching or disturbing ACM including any debris suspected of containing asbestos, except as specifically authorized in writing by the Asbestos Coordinator on a case-by-case basis

- **Provide asbestos awareness training to all employees who may be exposed to asbestos during their work**

General awareness training *must* be presented to maintenance and custodial workers whose work responsibilities may require contact with ACM or suspect ACM. Training generally covers the following topics:

- Identification of ACM, its forms, and uses
- Health effects of asbestos exposure
- Recognition of damaged ACM
- Locations of ACM in the buildings
- Name and telephone number of Asbestos Coordinator
- Asbestos program update.

Training Requirements of the DOSH Asbestos Standard

The DOSH asbestos standard (8 CCR §1529) includes training requirements that are triggered by exposures exceeding the action level. However, because DOSH intends to adopt the 1994 federal OSHA standard (29 CFR 1926.1101) whose training requirements are triggered by the types of activity and the quantity of material involved rather than by exceeding the action level, these requirements are discussed in this paragraph. Unless employees receive an appropriate level of training, those employees who work in buildings that contain ACM run the risk of disturbing the materials.

Pursuant to 29 CFR 1926.1101, employers must provide "Class IV" training to all employees who engage in activities during which they may contact known or suspect ACM or who engage in activities to clean up ACM debris. DOSH defines ACM as containing greater than 0.1 percent asbestos. These employees include custodial or maintenance employees employed by or contracted on behalf of the USARC. The general awareness sessions described above

should satisfy the OSHA training requirements for Class IV employees.

Maintenance and custodial employees who receive awareness training are *not* qualified to wear respirators or to enter a regulated asbestos abatement work area for any reason. They must be taught to recognize and respect posted areas. Although 29 CFR 1926.1101 defines training appropriate to employees who perform maintenance or custodial activities that disturb ACM (Class III), the removal of ACM other than TSI or surfacing materials (Class II), or the removal of TSI or surfacing materials (Class I), employees should be prohibited from disturbing ACM; therefore, Class I through III training is not required.

- **Conduct periodic surveillance of all areas that contain known or suspect ACM**

Each area that contains known or suspect ACM should be visually inspected periodically to evaluate changes in condition or friability and ensure that ACM condition has not deteriorated significantly during the preceding surveillance period. All friable materials should be inspected at least every 6 months and nonfriable materials should be inspected at least once a year.

Periodic surveillance generally includes visual inspection of all areas identified in this report as containing known, assumed, or suspected ACM to identify:

- Changes in the condition or friability of ACM
- Evidence of fiber release or noticeable debris
- Additional suspect materials
- Removal of ACM
- Projects that may involve disturbance of suspect (but unsampled) building materials or projects that may require removal of ACM.

- **Provide notification to owners, occupants, employees, and contractors**

Health and Safety Code §25915 et seq.

Also known as the Connelly Bill, these sections of the California Health and Safety Code require that all employees, outside contractors, and co-owners, including building occupants, be notified in writing regarding:

- Existence, location, accessibility, conclusions, and contents of asbestos survey reports and the asbestos management plan
- Specific locations of ACM
- General procedures and handling restrictions to prevent or minimize disturbance, release, or exposure
- Bulk and air sampling results, including the sampling and analytical procedures used
- Potential health risks or impacts that might result from exposure.

All occupants, employees, and owners must receive the above notification within 15 days following receipt of a survey report by the owner and annually thereafter. New occupants, employees, and owners must receive the above notification within 15 days from the start of the relationship.

The following types of contractors who may conduct work in the buildings should also be notified regarding ACM onsite:

- General
- Mechanical system service
- Lighting
- Roofing
- Flooring and carpeting

- Custodial service
- Elevator maintenance
- Cable TV installation and maintenance
- Security
- Telephone installation and maintenance.

Health and Safety Code §25249

The Safe Drinking Water and Toxic Substances Enforcement Act of 1986 (Proposition 65) applies to businesses of 10 or more employees and requires a warning of the risk of exposure to asbestos in buildings unless that exposure can be shown to be below the "no significant risk" (NSR) level or equal to background levels. Although the Proposition 65 NSR level for asbestos is below the reliable limits of quantification of the available analytical methods, as a precautionary measure, HLA recommends that notification language per Proposition 65 guidelines be included in the text of each asbestos notification provided pursuant to §25915.

A clear and reasonable "environmental exposure" warning sign must also be posted at least in each area where damaged ACM is present. Environmental warnings must be provided in a clear and conspicuous manner and under such conditions as to make it likely to be seen and read, or heard and understood by an ordinary individual in the course of normal daily activity, and reasonably associated with the location and source of the exposure.

Signs typically read:

"WARNING: This area contains a chemical known to the State of California to cause cancer."

OR

"WARNING: This facility contains asbestos, a substance known to the State of California to cause cancer."

These warning signs are available commercially, commonly with black letters on a white background.

Title 29 CFR Part 1926.1101

The 1994 federal OSHA standard 29 CFR 1926.1101 requires notifications prior to and immediately following the performance of any work covered by the standard, in addition to those identified above, although the Connelly Bill notification satisfies some of the OSHA requirements.

- The building operator must notify in writing the following persons who will occupy or perform work in areas containing known or suspected ACM of the presence, location, and quantity of known and suspected ACM:
 - Prospective employers applying or bidding for work in or adjacent to areas containing known or suspected ACM
 - Employees of the owner who will work in or adjacent to areas containing known or suspected ACM
 - On multiemployer worksites, all employers of employees who will perform work in or adjacent to areas containing known or suspected ACM
 - Tenants who will occupy areas containing known or suspected ACM.
- The building operator must post signs at the entrance to mechanical areas which employees reasonably can be expected to enter and which contain TSI or surfacing material that is known or suspected to contain asbestos. The sign must identify the material, its location, and the appropriate work practices which, if followed, will prevent disturbance of the material.
- Where feasible, the building operator must affix labels to all installed ACM containing greater than 1.0 percent

asbestos. These ACMs typically include TSI and some miscellaneous ACM. The labels should be placed where they can be clearly noticed by the occupants of the area and contain the following information:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE
HAZARD**

Signs may be posted in lieu of the labels so long as they contain the same information.

- Within 10 days of the completion of work by an asbestos abatement contractor, the contractor must inform the building owner/operator of the current location and quantity of known and suspected ACM remaining in the area and final monitoring results, if any.
- If any new known or suspected ACM is discovered on a worksite, the building owner/operator and the contractor must inform their employees and any other contractors working onsite of its presence, location, and quantity within 24 hours.
- **Perform removal, encapsulation, repair, and enclosure, as necessary**

Confirmed ACM within the building was visually identified and assessed by HLA as being in good condition during the survey; therefore, HLA does not recommend removal, encapsulation, repair, or enclosure of those materials at this time. Should conditions change for materials in good condition, the response actions may need to be modified.

Recommending that the ACM be placed in the O&M plan rather than recommending repair or removal was based on the following:

- Little or no debris or damage was observed in the building.

- The ACM is nonfriable.
- Work occurring in areas where ACM is located will be conducted by personnel trained in safe management of asbestos.
- Building occupants/employees will not be required to conduct tasks that will damage or disturb ACM.

If building demolition or renovation activities will disturb ACM, such activities must be preceded by removal of the affected ACM as required by the SCAQMD.

- ACM removal must be performed by a licensed and registered asbestos abatement contractor, in accordance with 8 CCR §1529.
- Friable asbestos waste and debris containing greater than 1 percent asbestos must be transported by a qualified hazardous waste hauler and disposed of in a manner consistent with applicable regulations at a landfill with operating permits and waste discharge requirements that allow it to accept asbestos-containing waste.
- If ACM removal is performed, an asbestos abatement project design should be prepared. This project design may consist of technical specifications and drawings or a detailed work plan. The asbestos abatement project design must be prepared by a project designer accredited pursuant to AHERA.
- Asbestos abatement project design, management, and monitoring should be conducted by a DOSH CAC and/or certified site surveillance technician (CSST).

7.0 ASBESTOS ABATEMENT COST ESTIMATES

HLA's asbestos abatement cost estimates are presented in Appendix E. These cost estimates were prepared on the basis of the type and quantity of asbestos present and historical unit costs for removal and disposal of these types of ACMs from military installations. It is assumed that all of the ACM would be removed as part of one project, with one associated mobilization, in an empty building. These cost estimates do not include related consulting costs.

Please note that asbestos abatement costs tend to be dependent on unpredictable variables such as seasonal workload, contractor availability, COE

and USARC administrative requirements, project phasing, and availability of insurance and bonding. Actual contractors' bids may be lower or higher than the opinion expressed herein. In view of these limitations, this estimate of cost should be considered only as an order-of-magnitude figure.

Typically, consultant/project management and abatement contractor oversight costs are approximately 20 percent of abatement contractor costs for larger projects. The following unit prices and production rates were used to compute the cost estimates:

Table 7.1 Unit-Price Estimates for Removal and Disposal of ACM

Material	Cost	Variables
Boiler insulation (BI)	\$15/sf	
Baseboard mastic (BM)	\$2/sf	
Bench tops (BT)	\$54/each	
Cement asbestos (CA)	\$1/sf or \$3/lf	
Carpet glue (CG)	\$2/sf	
Cloth (CL)	\$25/each	
Ceiling tile mastic (CM)	\$3/sf	
Ceiling tile (CT)	\$2/sf	
Debris (DB)	\$5/sf	on solid surface
	\$15/sf	on soil
Duct insulation - exterior (DE)	\$12/sf	if accessible
	\$18/sf	if not accessible
Duct insulation - interior (DI)	\$2/lf	to demolish duct
Duct sealant (DS)	\$6/sf	
Duct tape (DT)	\$5/lf	
Exhaust flue (EF)	\$4/lf	
Fire door (FD)	\$100/each	
Fitting, elbow, tee, valve (FI)	\$25 each	2"-6" outside diameter
	\$30 each	6"-12" outside diameter
	\$35 each	>12" outside diameter
	add \$5 each	if higher than 15 feet
Floor tile mastic (FM)	\$2/sf	
Fireproofing (FP)	\$16/sf	if accessible
	\$20/sf	if not accessible
Floor tile (FT)	\$2/sf	
Gloves (GL)	\$25/each	
Gasket (GS)	\$25/each	
Header insulation (HI)	\$35/sf	12"-18" outside diameter
	\$40/sf	18"-24" outside diameter
	\$45/sf	>24" outside diameter
	add \$5/sf	if higher than 15 feet

Material	Cost	Variables
Leveling compound (LC)	\$4/sf	
Linoleum mastic (LM)	\$2/sf	
Linoleum (LN)	\$2/sf	
Parapet emulsion (PE)	\$3/sf	
Penetration mastic (PM)	\$3/sf	
Pipe insulation (PI)	\$25/lf	2"-6" outside diameter
	\$30/lf	6"-24" outside diameter
	\$35/lf	>24" outside diameter
	add \$5/sf	if higher than 15 feet
Plaster (PL)	\$6/lf	if contains >1% asbestos
	\$3/sf	if contains <1% asbestos
Paint or textured coating (PT)	\$4/sf	
Putty (PY)	\$1/lf	
Roofing bitumen (RB)	\$3/sf	
Roofing felt (RF)	\$3/sf	
Refractory materials (RM)	\$4/sf	
Rope (RO)	\$1/lf	
Roof patching (RP)	\$3/sf	
Roofing - Transite (RT)	\$2/sf	
Spray-applied ceiling material (SA)	\$5/sf	
Stucco - exterior (SE)	\$4/sf	
Stucco - interior (SI)	\$6/sf	
Stack jacket (SJ)	\$15/sf	
Sheetrock (SR)	\$4/sf	if contains >1% asbestos
	\$2/sf	if contains <1% asbestos
Stair tread (ST)	\$2/sf	
Silvex emulsion (SE)	\$3/sf	
Tank insulation (TI)	\$2/sf	
Vapor barrier (VB)	\$12/sf	
Vibration joint cloth (VC)	\$75 each	
Wall or ceiling insulation (WC)	\$4/sf	
Window putty (WP)	\$200/window	

Notes:

lf = linear foot

sf = square foot

(1) Unit costs include contractor markup and disposal.

(2) Unit costs are applicable only to moderate-size projects; costs to perform small projects or very large projects should be independently derived.

(3) Unit costs are applicable only to accessible materials, except as noted above; costs to perform removal of inaccessible or difficult-to-reach materials should be independently derived.

Table 7.2 Production Rates for Removal of ACM

Average production rate to demolish and/or remove, and containerize ACM and detail clean work area and surfaces:

<u>Activity</u>	<u>Expected Production Rate</u>
Plaster/sheetrock	200 - 300 sf/person-day
Spray-applied ceiling material	300 - 500 sf/person-day
Fireproofing	150 - 300 sf/person-day
Floor tile, linoleum, and mastic	100 - 200 sf/person-day
Roofing materials	100 - 200 sf/person-day
Pipe insulation	20 - 50 lf/person-day
Tank and duct insulation	50 - 150 sf/person-day
Average Cost per Person-Day:	\$400 to \$500
Average Cost per Person-Hour (straight time):	\$40 to \$60

8.0 QA/QC RESULTS

Split samples were collected at a rate of 5 percent (a minimum of one sample) of all collected samples and were sent separately to MAL for analysis to verify FASI's analytical results. The table below is a comparison of the results. Laboratory analytical reports are contained in Appendix D.

HLA considers the quality of FASI's results to be acceptable based on laboratory QA results from MAL.

Table 8.0
QA/QC Analytical Results Comparison

Primary Sample Number	Results (Percent Asbestos)	QC Sample Number	Results (Percent Asbestos)
AV0821104	Trace chrysotile tile = none detected mastic = 1-5% chrysotile	AV0821107	Trace chrysotile tile = none detected mastic = 8% chrysotile

9.0 LIMITATIONS

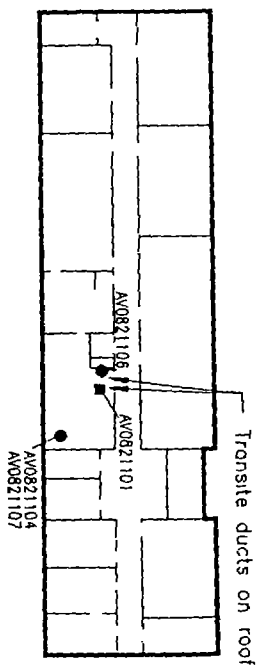
This survey was planned and implemented on the basis of a mutually agreed scope of work and HLA's previous experience in performing building surveys for ACM and the goals and objectives of the COE. The survey was conducted in conformance with generally accepted current standards for identifying and evaluating asbestos in building materials. HLA uses only qualified professionals to perform building surveys; however, without access to all building areas and destructive bulk sampling and analysis of all building materials in all buildings, HLA cannot warrant that these buildings do not contain ACM in locations other than those noted in this report. HLA was not able to access the roof of the OMS Building during the survey.

HLA's assessment of the risk of exposure to airborne asbestos fibers followed generally accepted protocols and is based on conditions at the time of the survey. HLA is not responsible for changes in conditions or accepted protocols subsequent to our site visit.

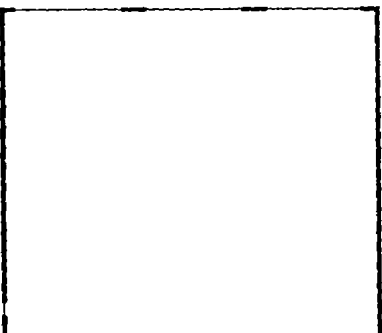
This report is not intended to be an asbestos abatement design document and should not be used for that purpose or for obtaining bids for asbestos abatement.

This document was prepared for the sole use of the COE, the USARC, and the 63rd ARCOM, the only intended beneficiaries of the work. No other party should rely on the information contained herein without prior written consent of HLA.

PLATE

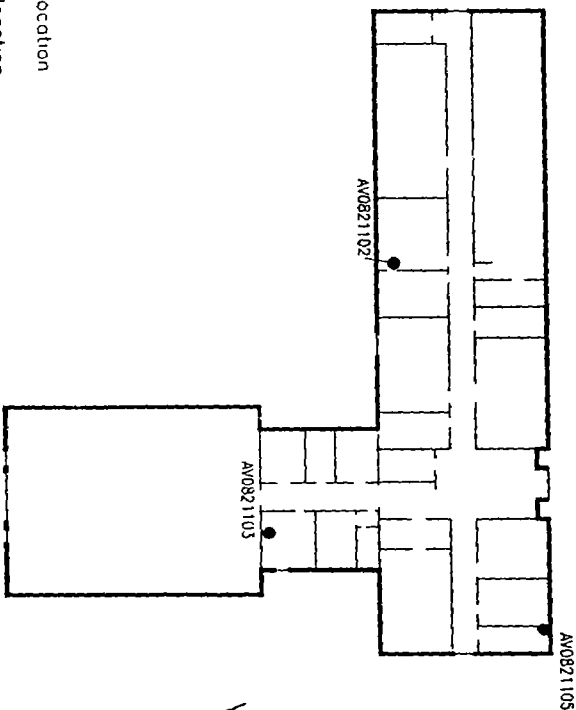


**ADMINISTRATION BUILDING -
SECOND FLOOR**



**OPERATIONS
MAINTENANCE
SHOP**

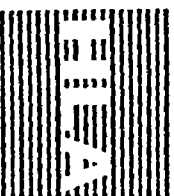
- EXPLANATION**
- Bulk sample location
 - Roof sample location



**ADMINISTRATION BUILDING -
FIRST FLOOR**

Scale 0 100 feet
APPROXIMATE

Not to scale



Harding Lawson Associates
Engineering and
Environmental Services

DRAWN **JTL** PROJECT-TASK NUMBER
30261-002232

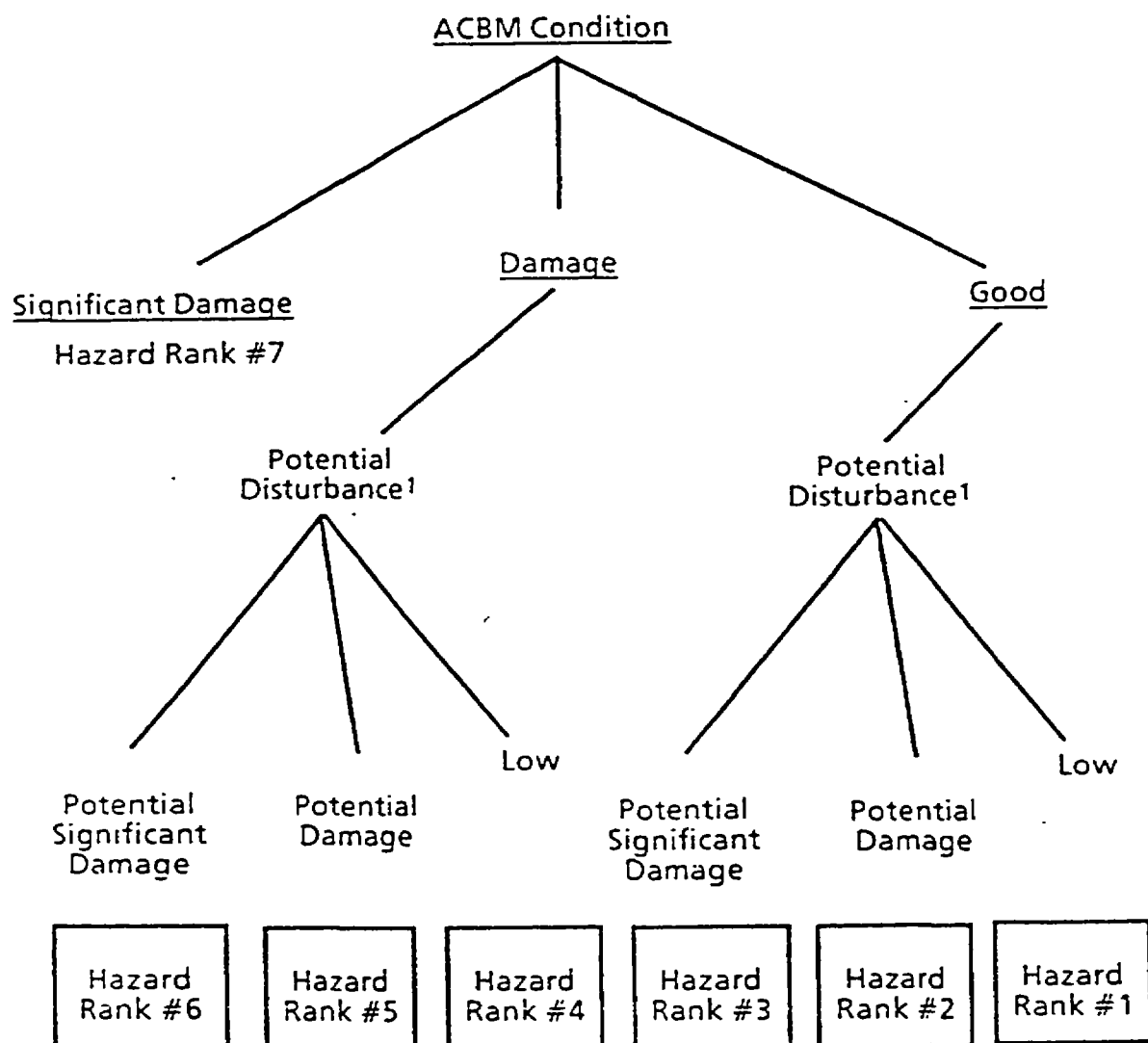
**ASBESTOS SURVEY -
ADMINISTRATION BUILDING AND
OPERATIONS MAINTENANCE SHOP**
U.S. Army Reserve Center
Long Beach, California

APPROVED DATE
1/96

REVISED DATE

APPENDIX A
ASSESSMENT AND HAZARD RANKING CRITERIA

EXHIBIT C-1. CLASSIFICATIONS FOR HAZARD POTENTIAL
(DECISION TREE DISPLAY)



¹ See Appendix C-1 (EXHIBIT C-1-3) for classification scheme.

**EXHIBIT C-2. CLASSIFICATIONS FOR HAZARD POTENTIAL
(TABULAR DISPLAY)**

<u>Hazard Rank</u>	<u>ACBM Condition</u>	<u>ACBM Disturbance Potential</u>
7	Significantly Damaged	Any
6	Damaged	Potential for Significant Damage
5	Damaged	Potential for Damage
4	Damaged	Low
3	Good	Potential for Significant Damage
2	Good	Potential for Damage
1	Good	Low

EXHIBIT C-3. RESPONSE ACTIONS BASED ON HAZARD RANKING

Hazard Rank	Removal Priority	AHERA Categories	Response Actions Required by AHERA
7	1	Significantly Damaged	Evacuate or isolate the area if needed. Remove the ACBM (or enclose or encapsulate if sufficient to contain fibers). Repair of thermal system insulation is allowed if feasible and safe. O&M required for all friable ACBM.
6	2	Damaged + Potential for Significant Damage	Evacuate or isolate the area if needed. Remove, enclose, encapsulate, or repair to correct damage. Take steps to reduce potential for disturbance. O&M required for all friable ACBM.
5	3	Damaged + Potential for Damage	Remove, enclose, encapsulate, or repair to correct damage. O&M required for all friable ACBM.
4	4	Damaged	Same as hazard rank 5
3	5	Potential for Significant Damage	Evacuate or isolate the area if needed. Take steps to reduce potential for disturbance. O&M required for all friable ACBM and TSI.
2	6	Potential for Damage	O&M required for all friable ACBM and TSI.
1	7	All Remaining ACBM	O&M required for all friable ACBM, but measures need not be as extensive as above.

Note: AHERA does not account for combinations of current and potential damage (i.e., hazard ranks #5 and 6). The response actions shown are combinations of those required for each condition.

EXHIBIT C-4. CLASSIFICATIONS FOR THE LEVEL POTENTIAL DISTURBANCE

Level of Potential Disturbance	Frequency of Potential Contact	Influence of Vibration	Potential for Air Erosion
HIGH ("potential for significant damage" as defined in AHERA)	High	Any Value	Any Value
	Any Value	High	Any Value
	Any Value	Any Value	High
MODERATE ("potential for damage" as defined in AHERA)	Moderate	Moderate or Low	Moderate or Low
	Moderate or Low	Moderate	Moderate or Low
	Moderate or Low	Moderate or Low	Moderate
Low	Low	Low	Low

APPENDIX B

IT CORPORATION ASBESTOS SURVEY REPORT

U.S. ARMY CORPS OF ENGINEERS
ASBESTOS ASSESSMENT SURVEY
LONG BEACH USARC, LONG BEACH, CALIFORNIA

BY

DALE WALSH
JOSEPH JEFFERY
FREDRICK J. MLAKAR, CIH

IT CORPORATION
17605 FABRICA WAY
CERRITOS, CA 90701

PROPOSAL NO: 956
CONTRACT NO.: DACA05-87-D0300

FOR

U.S. DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CA 95814-4794

AUGUST, 1988

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Appendix E	Operational Plans for Abatement
Appendix F	Removal/Replacement Cost Estimate
Appendix G	Certificates of Analysis
Appendix H	Quality Control
Appendix I	Exposure Assessment Algorithm Description

1.0 INTRODUCTION

This report describes the findings of an asbestos survey conducted at the Long Beach U.S. Army Reserve Center (USARC) in Long Beach, California. The survey consisted of an assessment of building numbers 2 and 101 for the presence of asbestos containing material (ACM) and the sampling of suspect ACM.

The survey was conducted on May 10-11, 1988 by Dale Walsh of the IT Corporation office located at 17605 Fabrica Way, Cerritos, CA. Mr. Walsh is an industrial hygienist who is also accredited as an Asbestos Management Planner and Building Inspector. A total of 11 samples were collected from various sites in and around the buildings.

This report also includes response recommendations and cost estimates for the total removal and replacement of all ACM that was found to be present in the buildings.

2.0 METHODS

Samples were collected by saturating the sampling area with amended water and then removing the sample by either coring, cutting or lifting a piece of the material from the substrate and placing it into a sealable plastic bag. After the sample was taken any exposed friable areas were sealed with a latex sealant or spray paint to encapsulate the area and prevent fiber release.

Samples were sent to the EMS Laboratories, Inc. in South Pasadena, California for Polarized Light Microscopy (PLM) analysis. Samples were analyzed using the EPA Interim Method for Determination of Asbestos in Bulk Insulation Samples (Method No. 600/M4-82-020). The EMS Laboratory is accredited by the American Industrial Hygiene Association (AIHA) and participates in the Research Triangle Institutes round robin proficiency in analytical testing program which is currently in the process of being changed to the National Bureau of Standards proficiency testing program. The certificates of analysis for the samples can be found in Appendix G.

Duplicate samples collected for quality control purposes were sent to the IT Corporation laboratory in Cerritos, CA. This laboratory possesses the same credentials and utilizes the same analytical technique as EMS Laboratories, Inc. Results of the quality control sampling and the certificates of analysis for the duplicate samples can be found in Appendix H.

Each homogeneous sampling area (an area of suspected ACM having the same color and texture) was rated numerically using the EPA algorithm which takes into consideration eight factors. These factors include: material condition, water damage, exposed surface area, accessibility, activity and movement, proximity to air plenums or direct air streams, friability, and asbestos content. The algorithm is described in detail in Appendix I. However, with the recent promulgation of the Asbestos Hazard Emergency Response Act (AHERA), the U.S. EPA has changed its position and now discourages the use of the algorithm because two EPA sponsored studies have indicated poor correlation of the algorithm with airborne fiber measurements and because the EPA philosophy of asbestos control and maintenance has changed. Instead, the EPA now requires an updated non-numerical method of evaluating and rating school buildings using the guidelines specified in AHERA as applied through the judgement of building inspectors who have successfully completed an EPA-accredited building inspection course. Therefore, although algorithm factors appear on the data table (Appendix A) in accordance with the Scope of Work, our recommendations (Appendix B) were based on AHERA methods which are currently accepted as 'state-of-the-art'.

Sample locations are identified by sample number on maps found in Appendix C. Photographs of sample locations can be found in Appendix D.

3.0 DISCUSSION

A total of three asbestos containing materials were identified at the Long Beach USARC. Of the three types of ACM only the pipe lagging elbows on the piping which had fiberglass straight runs was considered friable. The remaining non-friable ACM included: a small transite (asbestos cement-like material) board and two transite ducts both located in the boiler room. All of these materials were located in Building 2 (the Main USARC building).

Building 101 was a maintenance shop which contained no building systems (ie. hot water pipes, steam pipes, floor tiles etc.) that might contain asbestos, except the roof.

For the most part the ACM found at the Long Beach USARC posed little or no hazard to the occupants of the buildings. The only area in which asbestos posed a potential hazard was the silver painted unwrapped pipe lagging elbows on the north wall of the map room. The asbestos was fairly well encapsulated by the silver paint, however, removal would be simple and would prevent possible future fiber release caused by inadvertant contact by occupants.

The remaining undamaged ACM presented no hazard if left undisturbed, and need only be removed prior to construction, maintenance or demolition activities which may otherwise cause disturbance. Nevertheless, total removal is an option to consider in order to avoid the long term costs of an asbestos operations and maintenance program. Therefore, brief asbestos abatement operational plans and itemized code A cost estimates are given in Appendix E and F, respectively.

The fixtures and pipes in the boiler room of building 2 were found to be insulated with fiberglass. Straight pipe runs inspected throughout the building were also insulated with fiberglass.

The estimated costs for the removal and replacement of asbestos found in the Long Beach USARC buildings are as follows:

Building 2: \$ 2,256.00

Building 101: \$ 0.00

The estimates of costs are considered budgetary figures only and should not be used for comparison of contractor bidding prices. The estimates are based on second quarter, 1988 prices and are good for the scope of work outlined only.

APPENDIX A
TABLE OF SAMPLING RESULTS

APPENDIX A
USARC LONG BEACH

Sample Number	Location	Material Description	Percent Asbestos	Type	Friable	EPA Algorithm Score
LB1A	Bldg. 2 - Hot water tank in SE corner of boiler room	Hot water tank insulation	ND	--	Yes	0
LB1B	Bldg. 2 - Middle of boiler room attached to large air duct	Transite board	10	C	No	0
LB1C	Bldg. 2 - Floor next to north, front entrance	12"x12" speckled beige floor tile	ND	--	No	0
LB1D	Bldg. 2 - Ceiling in hallway south of front entrance near latrine at crawlspace access	Drywall	ND	--	No	0
LB1E	Bldg. 2 - Above ceiling at same location as LB1D	4" pipe lagging elbow; fiberglass straights	4	C	Yes	2
LB1F	Bldg. 2 - Roof over boiler room	Roof	ND	--	No	0
LB1G	Bldg. 2 - Roof over single story T part of building	Roof	ND	--	No	0

APPENDIX A
USARC LONG BEACH
(CONTINUED)

Sample Number	Location	Material Description	Percent Asbestos	Type	Friable	EPA Algorithm Score
LB1H	Bldg. 2 - Middle southwall of room 111	12"xl2" acoustic pegboard tiles	ND	--	Yes	0
LB1I	Bldg. 2 - Middle south wall of room 111	Wallboard - uniform holes	ND	--	No	0
LB1J	Bldg. 2 - North wall west of entrance in large map room	3" pipe lagging elbow fiberglass straights	4	C	Yes	32
LB2A	Bldg. 101 - NE corner of roof	Roof	ND	--	No	0

ND - None detected (Detection limit of PLM method = 1% by area)

C = Chrysotile asbestos

Friable = any material which can be crumbled, pulverized or reduced to powder, when dry, by hand pressure.

Note: Transite refers to very hard, concrete-like asbestos containing materials such as wallboards, piping and ducts. It is a brand name commonly used for these materials.

APPENDIX B

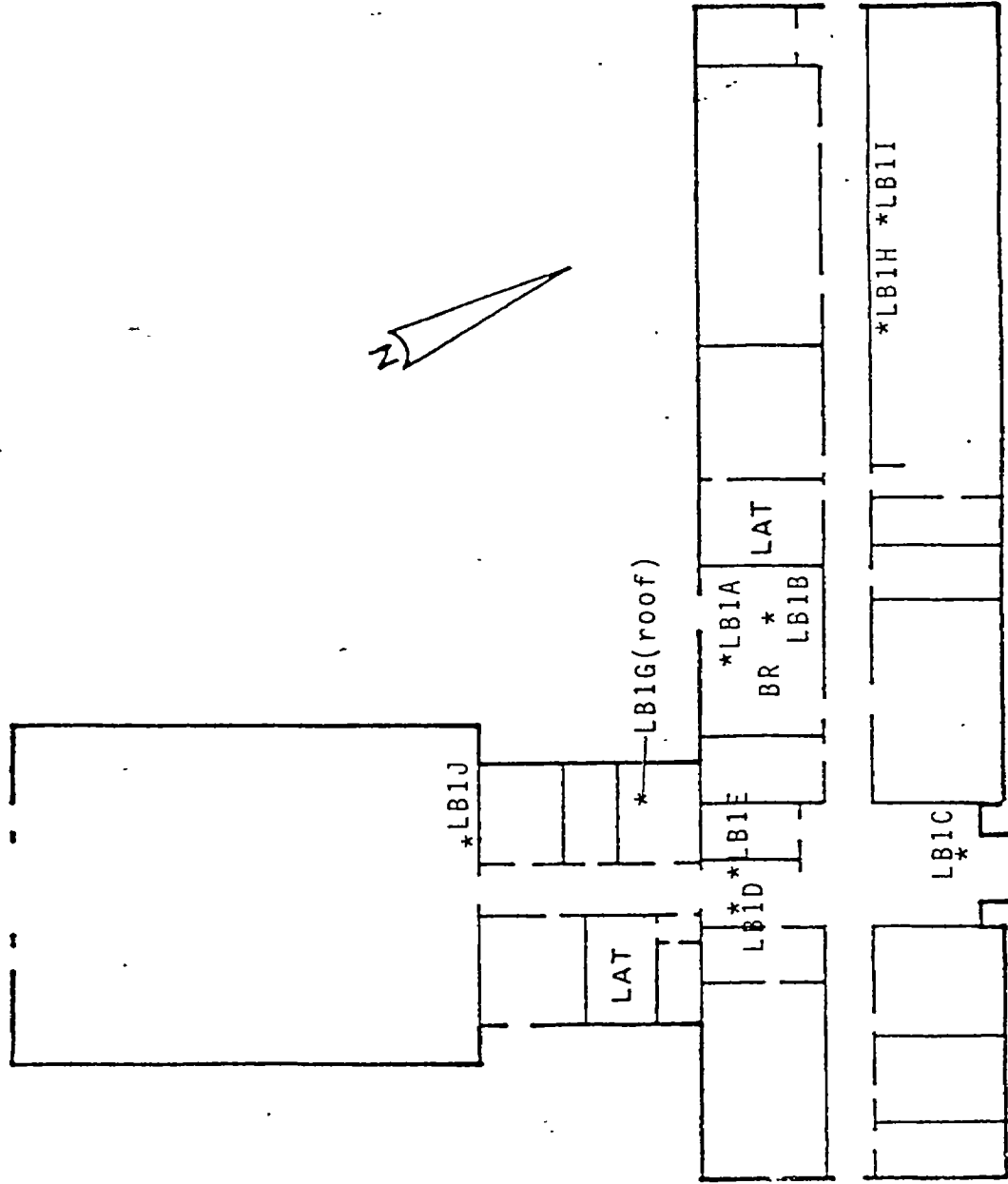
TABLE OF ACM CONDITION, LOCATION
AND RECOMMENDED ACTION

APPENDIX B

Sample No.	Material Condition	Material Location	Recommended Action
LB1E/ LB1J	Unwrapped, exposed elbows; remaining elbows are hidden and in good shape	North wall of map room.	Remove exposed elbows to prevent future damage. Remaining elbows are inaccessible and in good condition.
LB1B	Transite board is in good condition.	Middle of boiler room. Bracing ductwork.	Remove from area or paint and mark board to prevent disturbance.
	Transite duct is in good condition.	Boiler room going from furnace to roof.	Location should be identified and marked to avoid possible disturbance. Removal is not necessary.

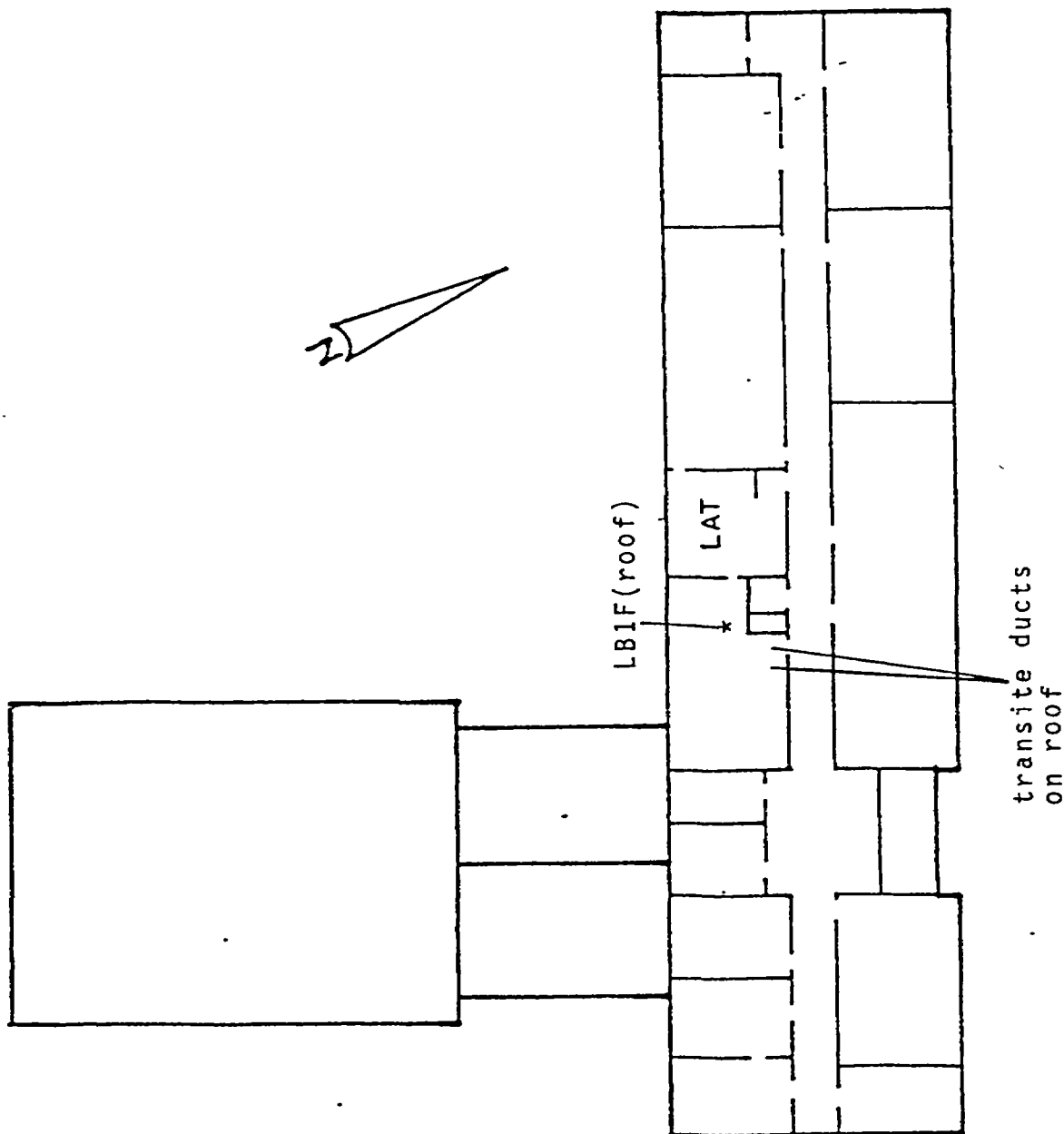
APPENDIX C
LOCATION MAPS

FLOOR PLAN
LONG BEACH U:
1st. FLOOR
BUILDING 2

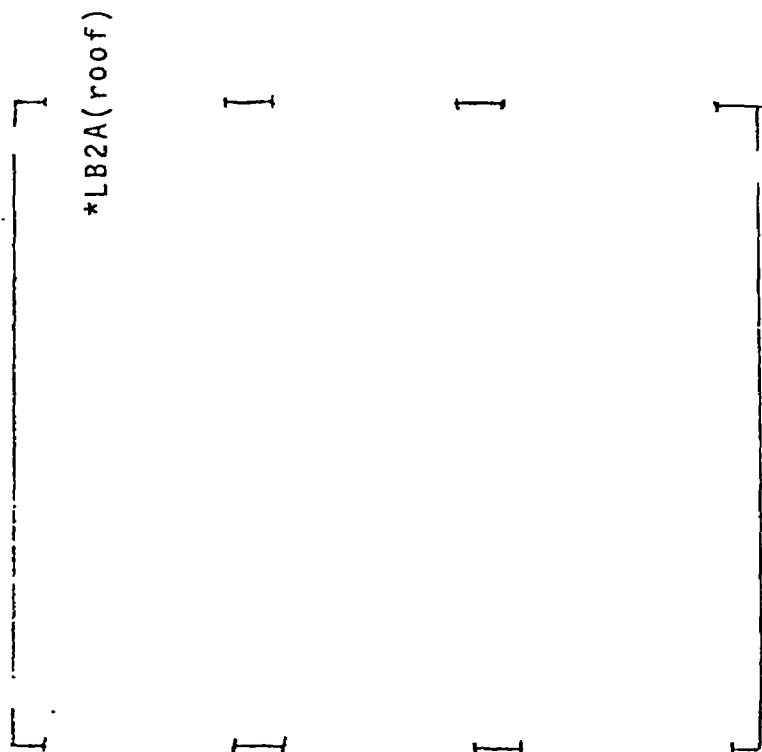


BR = boiler room

FLOOR PLAN
LONG BEACH USAI
2nd FLOOR



^



LONG BEACH USARC BLDG 101
MAINTENANCE

CERTIFICATE OF COMPLETION
ASBESTOS ABATEMENT PROJECT

PROJECT: Asbestos Abatement Monitoring
Kitchen Area - Administration Building
U.S. Army Reserve Center
Long Beach, California

SCOPE OF WORK: Removal of all asbestos-containing materials as outlined in the scope of work transmitted to Integrity Environmental Consultants, Inc. on November 20, 1998 by 63D Regional Support Command and included approximately 260 square feet of vinyl floor tiles and mastic

OWNER: 63D Regional Support Command
AFRC-CCA-ENS, Building 7
1200 Lexington Drive
Los Alamitos, California 90720-5002

CONSULTANT: Integrity Environmental Consultants, Inc.

CONTRACTOR: AC and S

PROJ. DURATION: December 11, 1998

- 1 This is to certify that we have supervised proper removal and disposal of all the above-referenced asbestos-containing building materials
- 2 That throughout the work all applicable regulations and requirements of the owner specifications were observed.
- 3 That any person who entered the designated work area was protected with the required full-body disposable clothing and adequate respiratory protection. All workers followed the prescribed entry/exit procedures as well as the proper operating procedures throughout their presence in the work areas.
- 4 That all employees of AC and S, engaged in this work, were trained in respiratory protection and experienced with asbestos abatement work. These workers had complete medical records authorizing them to work in respirators and were not exposed at any period of work without the benefit of adequate respiratory protection.
- 5 That conditions inside the work area were always safe, and that the maximum asbestos fiber count outside the work areas did not exceed 0.01 fiber per cubic centimeter (f/cc) of ambient air.
- 6 That Integrity Environmental Consultants, Inc. performed final inspection, air sampling, and testing recommended by applicable regulations. The work performed by AC and S was found satisfactory, and final clearance air sample analyses indicated particulate concentrations within acceptable levels of 0.01 f/cc.

AC and S:

Project Competent Person:

Name: _____ Signature: _____ Date: _____

Principal In Charge:

Name: _____ Signature: _____ Date: _____

Integrity Environmental Consultants, Inc.

Principal In Charge:

Name: Massoud Rahdari
CAC#92-0376/REA#04138

Signature: Massoud Rahdari Date: 12/11/98

COST ESTIMATE FOR ASBESTOS ABATEMENT AND REMOVAL

SCOPE OF WORK

Subject: Asbestos Abatement at Long Beach U.S. Army Reserve Center, Long Beach, California

Description of Work:

Conduct an asbestos abatement for removal of 12-inch by 12-inch white mottled floor tile and associated mastic at the kitchen room/area of Long Beach U.S. Army Reserve (USAR) Center, California. The Center is located at 3800 E. Willow Street, Long Beach, California. The area for abatement to be performed is approximately 260 sq. ft. in area. The floor plan/layout of the building is attached as Enclosure-1. The USAR building is currently occupied and there are full-time administrative personnel working in the building.

Asbestos containing material (ACM) was identified in a comprehensive survey conducted in 1996. An asbestos sampling and analyses had been performed for the floor tile and associated mastic by an accredited laboratory. Analytical results indicate that this material contains a trace amount of chrysotile asbestos as a composite sample. Asbestos was not detected in the floor tile and the mastic contains 1-5% chrysotile asbestos in the kitchen area. The material is non-friable.

Air monitoring of the area needs to be performed as part of the asbestos abatement work to ensure clearance on the project after completion. Air samples prior to the start of abatement and during the project shall be collected. Final air clearance sampling and analyses shall be performed prior to the removal of work area barriers.

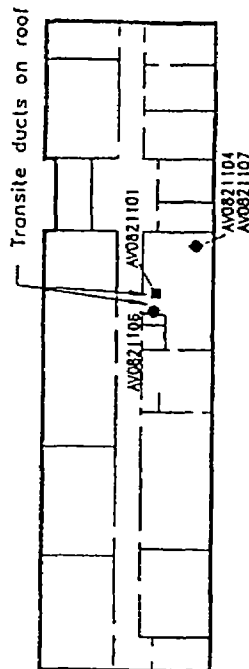
General:

All work shall be performed by a State of California licensed contractor and in accordance with federal, state, and local laws and regulations. The scope of the project involves proper removal and disposal of non-friable ACM as defined by South Coast Air Quality Management District (SCAQMD) Rule 1403 – Asbestos Emission from Demolition/Renovation Activities.

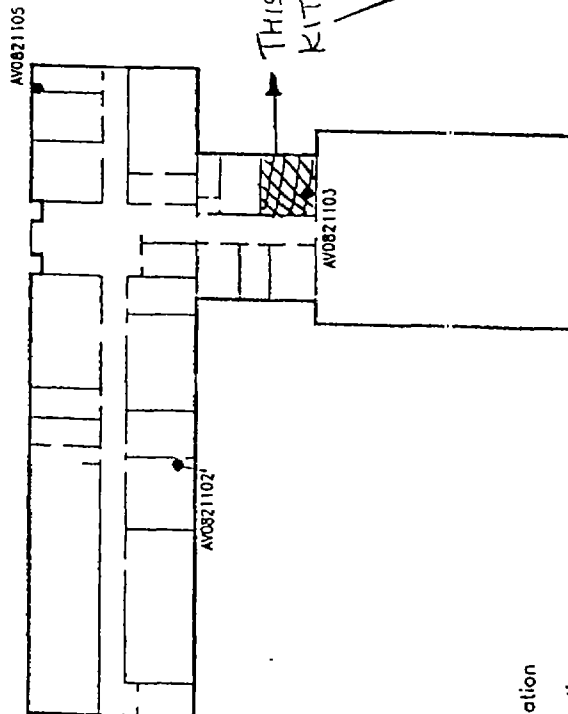
Report:

Prepare a brief closure report with description and attach copies of air monitoring results and manifest forms for disposal. One (1) copy of the report shall be submitted to the 63D RSC, Engineers Office, Environmental Division.

If you need any additional information, please contact Ms. Shyama Sundaram at Phone: (562) 795-1442, Fax: (562) 795-1499.



ADMINISTRATION BUILDING -
SECOND FLOOR



ADMINISTRATION BUILDING -
FIRST FLOOR

EXPLANATION

- Bulk sample location
- Roof sample location

Scale 0 50 100 feet
APPROXIMATE

OPERATIONS
MAINTENANCE
SHOP

Not to scale

ASBESTOS SURVEY -
ADMINISTRATIONS BUILDING AND
OPERATIONS MAINTENANCE SHOP
U.S. Army Reserve Center
Long Beach, California

APPROVED
DATE 1/96

APPENDIX D
PHOTOGRAPHS

LONG BEACH USARC MAIN BUILDING NO. 2

LB1A

LB1A

LB1B

LB1B

LB1C

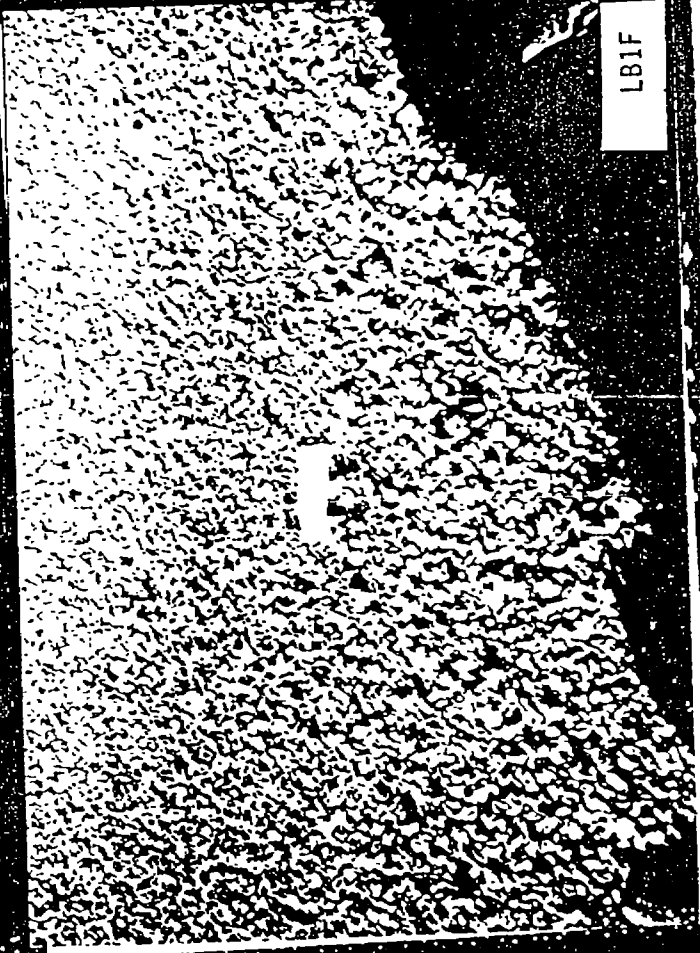
LB1C



LB1E



LB1G



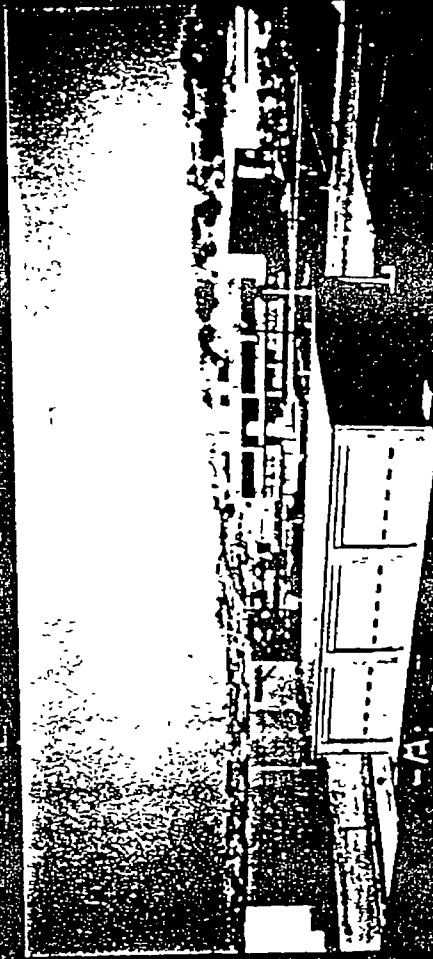
LB1F



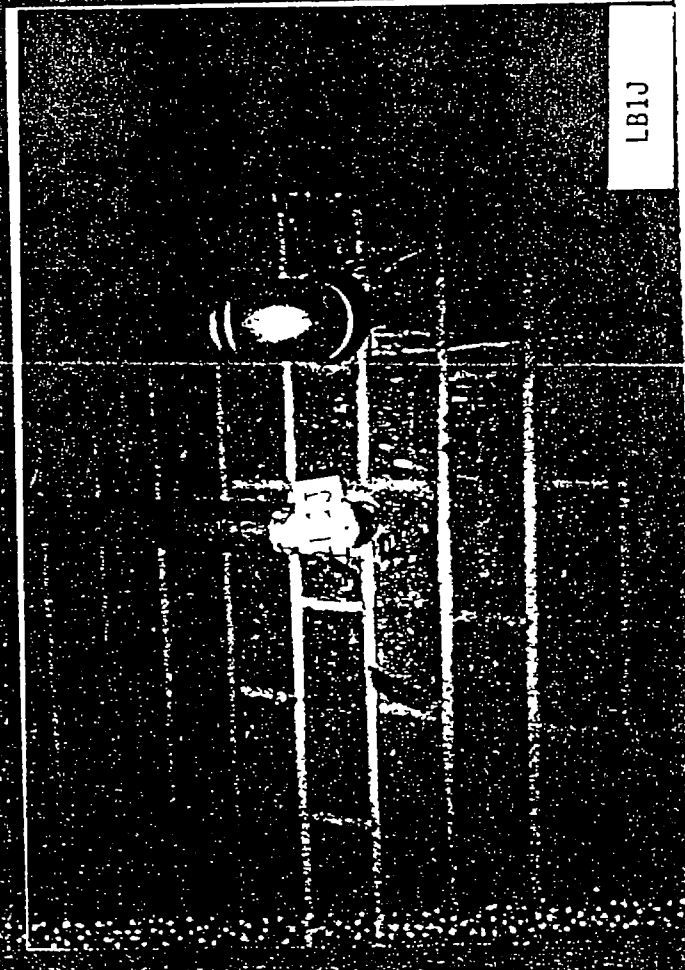
LB1D

LB1I

LB1H



LONG BEACH USARC MAINTENANCE SHOP
BUILDING NO. 101



LB1J

LB2A

APPENDIX E
OPERATIONAL PLANS FOR ABATEMENT

APPENDIX E

OPERATIONAL PLANS FOR ABATEMENT

The asbestos containing elbows in building 2 should be removed using the glovebag technique in which a specially trained and protected worker encloses the removal process with a specially designed bag that retains any fibers that are generated as the result of removal. The asbestos should be kept wet during removal.

The transite board in the boiler room of building 2 can simply be unbolted from the ductwork while keeping it wetted down to prevent any possible fiber release.

The transite ducts going from the furnace to the roof should be removed intact and should be wetted during removal or painted to prevent fiber release.

All remediation projects should be conducted only by properly trained and protected workers, in accordance with the OSHA asbestos standard.

In each removal project air monitoring should be conducted during and after asbestos abatement but prior to the removal of the containment barrier (if appropriate). Post-abatement air levels of asbestos should not exceed 0.01 fibers per cubic centimeter.

Appropriate government agencies (ie. OSHA and EPA) should be notified prior to removal, and the asbestos wastes should be disposed of at an approved waste facility.

APPENDIX F

REMOVAL/REPLACEMENT COST ESTIMATES

ASBESTOS ABATEMENT ESTIMATE
LONG BEACH
BUILDING NUMBER 2
U. S. ARMY CORPS OF ENGINEERS

PROJECT ACTIVITY	QUANTITY	UNIT	LABOR UNIT	LABOR TOTAL	MATERIAL UNIT	MATERIAL TOTAL	EQUIPMENT UNIT	EQUIPMENT TOTAL	TOTAL COST
			\$	\$	\$	\$	\$	\$	
<hr/>									
DIRECT COSTS									
				13.416					
PREPARATION FOR ASBESTOS REMOVAL									
Erect Personnel Enclosure (Not Required (NR))	0	EA	0.00	0.00	0.00	0.00	0.00	0.00	\$0
Erect Decontamination Enclosure (NR)	0	EA	0.00	0.00	0.00	0.00	0.00	0.00	\$0
Cover Area Walls With 6 Mill Plastic	200	SF	0.13	26.00	0.05	10.00	0.00	0.00	\$36
Cover Area Floor With 2 x 6 Mill Plastic	100	SF	0.27	27.00	0.10	10.00	0.00	0.00	\$37
TOTAL PREPARATION FOR ASBESTOS REMOVAL				53.00		20.00		0.00	\$73
ASBESTOS REMOVAL									
Transite									
Transite Board	4	SF	0.94	3.76	0.00	0.00	0.00	0.00	\$4
Transite Duct 6"	20	LF	0.67	13.40	0.00	0.00	0.00	0.00	\$13
Transite Duct 10"	20	LF	0.80	16.00	0.00	0.00	0.00	0.00	\$16
Pipe Insulation - Glovebag Removal									
Fittings									
3"	3	EA	0.90	2.70	1.76	5.29	0.00	0.00	\$8
Fittings									
4"	3	EA	1.00	3.00	1.76	5.29	0.00	0.00	\$8
TOTAL ASBESTOS REMOVAL				38.86		10.58		0.00	\$49
DECONTAMINATION AND CLEANUP									
Final Cleanup Labor									
Walls	200	SF	0.13	26.00	0.00	0.00	0.00	0.00	\$26
Floors	100	SF	0.13	13.00	0.00	0.00	0.00	0.00	\$13
Sealant Applications									
Wall Plastic	200	SF	0.01	2.00	0.05	10.00	0.00	0.00	\$12
Floor Plastic	100	SF	0.01	1.00	0.05	5.00	0.00	0.00	\$6
Dismantle Personnel Enclosure (NR)	0	EA	0.00	0.00	0.00	0.00	0.00	0.00	\$0
Dismantle Decontamination Enclosure (NR)	0	EA	0.00	0.00	0.00	0.00	0.00	0.00	\$0
Remove Plastic Protection	300	SF	0.02	6.00	0.00	0.00	0.00	0.00	\$6
Consumable Supplies	1	LOT	0.00	0.00	50.00	50.00	0.00	0.00	\$50
Special Equipment									
Negative Air Equipment HEPA filters (NR)	0	DAYS	0.00	0.00	0.00	0.00	0.00	0.00	\$0
HEPA Vacuum Cleaner and Maintenance	2	DAYS	3.35	6.71	8.80	17.60	11.79	23.58	\$48
Personnel Protection									

ASBESTOS ABATEMENT ESTIMATE
LONG BEACH
BUILDING NUMBER 2
U. S. ARMY CORPS OF ENGINEERS

PROJECT ACTIVITY	QUANTITY	UNIT	LABOR UNIT	LABOR TOTAL	MATERIAL UNIT	MATERIAL TOTAL	EQUIPMENT UNIT	EQUIPMENT TOTAL	TOTAL COST
			\$	\$	\$	\$	\$	\$	
Cartridges	4	EA	0.00	0.00	3.00	12.00	0.00	0.00	\$12
Full Body Disposable Clothing	8	EA	0.00	0.00	3.44	27.52	0.00	0.00	\$28
				-----			-----		
TOTAL REMOVAL AND CLEANUP				54.71		122.12		23.58	\$201
DISPOSAL COSTS									
Disposal Bags & Ties	6	EA	0.00	0.00	0.60	3.60	1.54	9.25	\$13
Fill Drums With Bags & Dispose	1	EA	0.00	0.00	6.00	6.00	53.66	53.66	\$60
				-----			-----		
TOTAL DISPOSAL COSTS				0.00		9.60		62.92	\$73
RE-INSULATION									
Install Replacement Materials									
Transite									
Transite Board \ Plastic Hardboard	4	SF	0.53	2.12	1.00	4.00	0.00	0.00	\$6
Transite Duct 6" \ Spiral Aluminum	20	LF	0.78	15.60	2.70	54.00	0.00	0.00	\$70
Transite Duct 10" \ Spiral Aluminum	20	LF	1.34	26.80	4.41	88.20	0.00	0.00	\$115
Pipe Insulation									
Fittings									
3"	3	EA	3.91	11.73	4.85	14.55	0.00	0.00	\$26
Fittings									
4"	3	EA	4.81	14.43	5.63	16.89	0.00	0.00	\$31
				-----			-----		
TOTAL RE-INSULATION				70.68		177.64		0.00	\$248
				=====			=====		
TOTAL DIRECT COSTS				217.25		339.94		86.49	\$644
INDIRECT COSTS									
GENERAL CONDITIONS @ 15% DL									\$33
CONTRACTOR BURDEN, OVERHEAD & PROFIT @ 45% TPC									\$304
ASBESTOS LIABILITY INSURANCE @15% TRL									\$147

TOTAL INDIRECT COSTS									\$484

ASBESTOS ABATEMENT ESTIMATE
 LONG BEACH
 BUILDING NUMBER 2
 U. S. ARMY CORPS OF ENGINEERS

PROJECT ACTIVITY	QUANTITY	UNIT	LABOR UNIT	LABOR TOTAL	MATERIAL UNIT	MATERIAL TOTAL	EQUIPMENT UNIT	EQUIPMENT TOTAL	TOTAL COST
			\$	\$	\$	\$	\$	\$	
SUBTOTAL									=====
									\$1,12
CONTINGENCY @10% TAPC									\$11
									=====
TOTAL ABATEMENT PROJECT COST									\$1,24
INDUSTRIAL HYGIENE SERVICES									
Air Sampling And Analysis									
Sample Type - TEM	0	EA	0.00	0.00	400.00	0.00	0.00	0.00	\$
Sample Type - PCM	5	EA	0.00	0.00	35.00	175.00	0.00	0.00	\$17
I.H. Services									
I.H. Technicians (On Site)	2	DAYS	360.00	720.00	0.00	0.00	0.00	0.00	\$720
Sr. I.H. (Management & Analysis) (NR)	0	DAYS	500.00	0.00	0.00	0.00	0.00	0.00	\$0
C.I.H.(Project Director)	0.1	DAYS	720.00	72.00	0.00	0.00	0.00	0.00	\$72
				-----			-----		
INDUSTRIAL HYGIENE SERVICES				792.00	175.00		0.00		\$967
CONTINGENCY @5%									
									\$48
									=====
TOTAL INDUSTRIAL HYGIENE SERVICES									\$1,015
TOTAL PROJECT COST									=====
									\$2,256
									=====

APPENDIX G
CERTIFICATES OF ANALYSIS



DATE: May 31, 1988

CLIENT: I.T. Corporation
17605 Fabrica Way
Cerritos, CA 90701

ATTENTION: Dale Walsh

REFERENCE: 510575

REPORT NO: 12548

SUBJECT: ANALYSIS OF MATERIAL FOR ASBESTOS

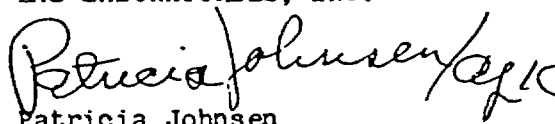
Seventy-eight bulk samples were received on May 18, 1988 for analysis of asbestos. Results were given to client on May 25, 1988.

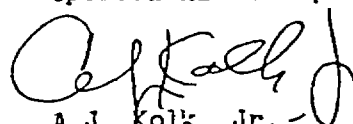
These samples were analyzed by the polarized light microscopy technique described in the "The Interim Method for Determination of Asbestos in Bulk Insulation Samples" (USEPA, December 1982).

The laboratory results are enclosed.

Respectfully submitted,

EMS LABORATORIES, INC.


Patricia Johnsen
Optical Microscopist


A.J. Kolk, Jr.
Technical Director

PJ/AJK/bg

EIS17P

Encl.



ASBESTOS BULK SAMPLE OPTICAL ANALYSIS LOG SHEET

Lab No: 12548
Date: 5/24/88

Client: IT Corporation
Analyst: Patricia Johnsen

SAMPLE ID ID	SAMPLE LOCATION & DESCRIPTION	VISUAL DESCRIPTION	ASBESTIFORM MINERALS	OTHER FIBROUS MATERIALS	NON-FIBROUS MATERIALS
LB -1A		White massive with paper backing	None detected	Cellulose Synthetics Fiberglass Cleavage fragments	Granular Minerals Resin Diatoms Vermiculite
LB -1B		Greenish grey fibrous massive	Chrysotile 10%	Cellulose(t)	Granular Minerals Opagues Resin
LB -1C		White tile block	None detected	Cellulose(t)	Granular Minerals Opague Resin
LB -1D		White massive and powdery	None detected	Cellulose	Granular Minerals Opagues Resin
LB -1E		Beige powdery	Chrysotile 4%	Cellulose(t) Glasswool	Granular Minerals Resin Diatoms
LB -1F		Black sticky tar	None detected	Cellulose Synthetics	Granular Minerals Opagues Organics(tar)

EMS LABORATORIES, INC. 507 Mission Street South Pasadena, CA 91030-3035 (818) 441-2393

T: trace

ASBESTOS BULK SAMPLE OPTICAL ANALYSIS LOG SHEET

Lab No: 12548
Date: 5/24/88

Client: IT Corporation
Analyst: Patricia Johnsen

SAMPLE ID ID	SAMPLE LOCATION & DESCRIPTION	VISUAL DESCRIPTION	ASBESTIFORM MINERALS	OTHER FIBROUS MATERIALS	NON-FIBROUS MATERIALS
LB -1G		Orange fibrous black tar	None detected	Cellulose Synthetics(t) Glasswool	Granular Minerals Organics(tar) Opagues Resin
LB -1H		Orange fibrous	None detected	Cellulose(t) Glasswool	Granular Minerals(t) Resin
LB -1I		Brown fibrous with white paint	None detected	Cellulose Glasswool(t)	Granular Minerals Opagues Resin
LB -1J		Beige fibrous with silver paint	Chrysotile 4%	Cellulose(t) Glasswool	Granular Minerals Opagues Resin Diatoms
LB -2A		Black fibrous massive	None detected	Cellulose Glasswool(t) Synthetics	Granular Minerals Organics(tar) Opagues

EMS LABORATORIES, INC. 507 Mission Street South Pasadena, CA 91030-3035 (818) 441-2393

T: trace

APPENDIX H
QUALITY CONTROL

APPENDIX H

QUALITY CONTROL

Quality Control (QC) samples were collected during the survey to help assess the accuracy of the analysis performed by the primary laboratory. Duplicates of approximately five percent of the samples collected throughout the survey of the seven USARC facilities were submitted to the IT Corporation laboratory for analysis. One hundred fifty-five samples were collected from the Stanton, Long Beach, El Monte, AMSA 32, San Bernardino, Fresno, and Bakersfield USARC facilities. A total of eight duplicates were sent to the IT Corporation laboratory. A comparison of the results obtained from the two labs is tabulated below.

SAMPLE NUMBER		RESULTS	
PRIMARY	DUPLICATE	PRIMARY	DUPLICATE
S5C	S5C-QA	3 - C	2 - C
S7B	S7B-QA	ND	ND
LB1B	LB1B-QA	10 - C	12 - C
EM8H	EM8H-QA	ND	ND
SB1B	SB1B-QA	5 - C 2 - A	52 - C 2 - A
SB1Y	SB1Y-QA	ND	ND
A32J	A32J-QA	1 - C	1 - C
F1F	F1F-QA	1 - C	2 - C

The differences noted between some of the quality control samples may be due to the inherent variability and high subjectivity of the analytical technique. Factors such as the part of the sample which was analyzed and the experience of the microscopist can cause the analysis of the same material to vary greatly not only from lab to lab but also within the same laboratory. The Research Triangle Institute bases its determination of laboratory analytical proficiency on whether a sample known to contain asbestos can be identified as containing asbestos by the laboratory being tested. The actual percentage reported is not considered, due to the great variability that is characteristic of the analytical technique (ranging as much as from 1% to 100%).

Considering the inherent variability associated with the analytical technique the results of the inter-lab replicate sample analysis indicate good correlation between the two labs. The quality control testing indicates that the primary laboratory analyses are reliable.



ANALYTICAL SERVICES

17605 Fabrica Way • Cerritos, California 90701 • 213-921-9831 / 714-523-9200



CERTIFICATE OF ANALYSIS

Prepared for: IT Corporation
17605 Fabrica Way
Cerritos, CA 90701

Date: July 29, 1988

Attn: Dale Walsh

Date Received: July 20, 1988

P.O. Number 465759.06
Corps of Engineers

Job Number 47340/sds
Page 1 of 3

Eight (8) bulk samples

The samples were analyzed for fibrous asbestos by polarized light microscopy with dispersion staining using EPA procedure 600/M4-82-020. The results are on the following pages.

I certify that this report truly represents the finding of work performed by me or under my direct supervision.

Mary Hammons
Mary Hammons
Group Leader

Reviewed and Approved

Ken Faust
Ken Faust
Technical Director

BULK SAMPLE ANALYSIS/EPH METHOD 600/M4-82-020

IT CORPORATION

Sample ID	S5C-QA	S7B-QA	LB1B-QA	EM8H-QA	SB1B-QA
Date Analyzed	7-30-88	7-30-88	7-30-88	7-30-88	7-30-88
Analytical Method: PLM with dispersion staining					
Gross	yes	yes	yes	yes	yes
Sample	yes	yes	no	yes	yes
Appearance	no	no	no	no	no
Is the sample homogeneous?	yes	yes	yes	yes	yes
Is the sample friable?	yes	yes	no	yes	yes
Does it contain obvious layers?	no	no	no	no	no
Is the sample fibrous?	no	yes	yes	yes	yes
Sample color	gray	beige	gray	brown	gray
Sample Treatment (enter number)	2. ground	2. ground	2. ground	0.	0.
Fibrous Asbestos Present (enter number & percent)	2. 2	0.	2. 12	0.	1. 2 2. 52
Percent Total Asbestos Present in Sample	2	ND	12	ND	54
Other Fibrous Materials Present (enter number)	0.	2.	0.	2.	2.
Nonfibrous Materials Present (description)	1.	1.	1.	1.	1.

Detection Limit: 1%

UN - The analyte was not detected.

BULK SAMPLE ANALYSIS/EPH METHOD 600/M4-82-020

IT CORPORATION

Sample ID		SB1Y-QA	A32J-QA	FIF-QA	
Date Analyzed		7-30-88	7-30-88	7-30-88	
Analytical Method: PLM with dispersion staining					
Gross	Is the sample homogeneous?	yes	yes	yes	
Sample	Is the sample friable?	no	no	yes	
Appearance	Does it contain obvious layers?	no	yes	no	
	Is the sample fibrous?	no	no	yes	
	Sample color	brown	brown/black	gray	
Sample Treatment (enter number)	0. None 1. Homogenized 2. Other, specify	2. ground	2. ground	2. dried	
Fibrous Asbestos Present (enter number & percent)	0. None 1. Amosite 2. Chrysotile 3. Crocidolite 4. Other, specify	0.	2. 1	2. 2	
Percent Total Asbestos Present in Sample		ND	1	2	
Other Fibrous Materials Present (enter number)	0. None 1. Fibrous glass 2. Cellulose 3. Other, specify	0.	2.	2.	
Nonfibrous Materials Present (description)	0. None 1. Unspecified 2. 3.	1.	1. Tar 2.	1.	

Detection Limit: 1%

D - The analyte was not detected at or above the detection limit.

APPENDIX I

EXPOSURE ASSESSMENT ALGORITHM DESCRIPTION

EXPOSURE ASSESSMENT - A NUMERICAL SYSTEM

An asbestos exposure assessment systems is a decision tool which can be used to determine the level of exposure to asbestos which exists in a building and which can also indicate what, if any, corrective action is required to control the problem. Chapter 7 "Exposure Assessment" of EPA's manual "Asbestos-Containing Materials in School Buildings: A Guidance Document-Part I" presents eight factors which must be considered by the building inspector when determining whether a hazardous condition exists due to the presence of asbestos. Presented is a method for numerically combining these factors to obtain an "Exposure Number" which, when compared to a "Corrective Action Scale" will indicate whether (and in some cases which) abatement action is necessary.¹ The actual characteristics of the asbestos-containing material and the activities in the vicinity of the material provided the basis for the selection of the eight assessment factors.

The numerical system has been prepared taking into consideration fiber characteristics, asbestos risk factors, and experience with school exposure situations. It is intended as a guide by which officials can determine the appropriate level of concern for an exposure problem. It will also aid in the selection of appropriate corrective methods. Chapter 7 points out limitations of exposure assessment, which apply to numerical as well as unquantified methods.

The numerical system has three steps:

- (1) the eight factors are assigned a numerical value by the inspector of the building;
- (2) the numerical values are combined by a mathematical formula to produce the Exposure Number; and
- (3) the Exposure Number is compared to the Corrective Action Scale.

These three steps should be performed for each area of the building in which asbestos has either been found or is believed to be present. The three steps of the exposure assessment are described below.

¹A true exposure assessment must consider factors such as duration of exposure and population characteristics. This numerical method does not include such factors directly.

3.1 STEP 1: FACTOR SCORE SELECTION

The Asbestos Exposure Assessment Factor Score Sheet (Appendix C) presents a list of the eight factors, a brief description of the range or extent to which a particular condition applies, and a numerical "Factor Score" corresponding to that description. The building inspector must first select the description best fitting the situation in that area. Only the scores indicated can be assigned to a factor. For example, "1", "3", and "4" are not acceptable scores for material condition. The selected score must then be written in the appropriate box (1 through 8) of the form which initiates Step 2.

The area to be evaluated may be any part of the building where the factors remain uniform. For example, an auditorium with both an inaccessible ceiling surface in the stage area and a very accessible and damaged surface in the audience area constitutes two different areas. The scores for the two areas may exhibit a wide variation in exposure numbers, a different exposure assessment, and possibly different corrective actions.

A detailed description of the eight factors representing each of the numerical values has been assembled.

To describe conditions by each of the numerical values and to provide some uniformity to the assigning of these values when different inspectors rate suspected ACM.

3.1.1 Assess Each of the Factors

Carefully consider each of the following seven factors (the eighth factor, asbestos content, must be determined from laboratory reports) and record observations.

3.1.1.1 Factor One - Material Condition

The condition of the ACM is the most important indicator of whether fibers have been released in the past or may be released in the future.

An assessment of the condition should evaluate: the quality of the installation, the adhesion of the friable material to the underlying substrate, deterioration, destruction of the material by water, vandalism which has damaged the material, and any other damage. Evidence of debris on

horizontal surfaces, material hanging, dislodged chunks, scrapings, indentations, or cracking are indicators of poor material condition.

Condition is closely related to other factors considered in the assessment inspection: if the ACM is accessible, it is likely to be damaged; if the activity level is high in the area, the level of damage may be high; and materials which are exposed may be more likely to sustain damage.

Accidental or deliberate physical contact with the friable material can result in damage to the ACM. Inspectors will look for any evidence that the ACM has been disturbed such as finger marks in the material, graffiti, pieces dislodged or missing, scrape marks from movable equipment or furniture, or accumulation of the friable material on floors, shelves, or other horizontal surfaces.

ACM may deteriorate as a result of the quality of the installation as well as environmental factors which affect the cohesive strength of the ACM or the strength of the adhesion to the substrate. Deterioration can result in dusting of the surface of the ACM, delamination of the material (i.e. separating into layers), or an adhesive failure of the material where it pulls away from the substrate and either hangs loosely or falls to the floor and exposes the substrate. Inspectors should touch the ACM and determine if dust is released when the material is lightly brushed or rubbed.

If the coated surface "gives" when slight hand pressure is applied or the material moves up and down with light pushing, the ACM is no longer tightly bonded to its substrate.

This factor is comprised of three levels:

- A. NO DAMAGE: Material is intact and shows no sign of deterioration.
No pieces larger than a half-dollar have been dislodged.
NUMERICAL VALUE: 0

- B. MODERATE DAMAGE-SMALL AREAS: Through visual inspection and physical contact there are indications that ten percent or less of the material is breaking up into layers or beginning to fall. There may be small areas where the material is deteriorating. There may be signs of accidental or intentional damage.

NUMERICAL VALUE: 2

- C. WIDESPREAD SEVERE DAMAGE: Greater than ten percent of the material is damaged. Large pieces are dislodged and/or debris in the area is evident. Parts of the material may be suspended from the ceilings (or other sources, e.g., pipes) or may have fallen to the floor. Evidence of severe accidental or intentional damage.

NUMERICAL VALUE: 5.

3.1.1.2 Factor Two - Water Damage

Water damage is usually caused by roof leaks, particularly in buildings with flat roofs or a concrete slab and steel beam construction. Skylights can also be significant sources of leaks. Water damage can also result from plumbing leaks and water in the vicinity of pools, locker rooms, and lavatories.

Water can dislodge, delaminate, or disturb friable ACMs that are otherwise in good condition and can increase the potential for fiber release by dissolving and washing out the binders in the material. Materials which were not considered friable may become friable after water has dissolved and leached out the binders. Water can also carry fibers as a slurry to other areas where evaporation will leave collection of fibers that can become resuspended in the air.

Each area will be inspected for visible signs of water damage such as discoloration of the ACM, stains on the ACM, adjacent walls, or floor, buckling of the walls or floor, pipe and boiler insulation, or areas where pieces of the ACM have separated into layers (delaminated) or come loose and fallen down thereby exposing the substrate.

Close inspection is required. In many areas staining may only occur in a limited area while water damage causing delamination may have occurred in a much larger area.

Delamination is particularly a problem in areas where the substrate is very smooth concrete slab. Check to see if the material "gives" when pressure is applied from underneath.

This factor is comprised of three levels:

A. NO WATER DAMAGE: No water stains or evidence of the material being disturbed by water. No stains on the floor or walls to indicate past water damage.

NUMERICAL VALUE: 0

B. MINOR WATER DAMAGE: Small areas of the material or adjacent floor and/or walls show water stains and ceiling material may be slightly buckled. However, pieces have not fallen from the source and the damage affects ten percent or less of the material.

NUMERICAL VALUE: 1

C. MODERATE TO MAJOR WATER DAMAGE: Water has dislodged some of the material and caused the material to break away, or has become saturated and has the potential to fall, and/or greater than ten percent of the material has been affected. Asbestos fibers have been carried from the ACM by water, evaporation has occurred, and the fibers have been deposited on other surfaces.

NUMERICAL VALUE: 2

3.1.1.3 Factor Three - Exposed Surface Area

The amount of ACM exposed to the area occupied by people can increase the likelihood that the material may be disturbed and determines whether the fibers can freely move through the area. As ACM is considered exposed if it can be seen, i.e. if there are no physical barriers which must be moved in order to get to the material. For a material not to be exposed, the barrier must be complete, undamaged, and not likely to be removed or dislodged. An ACM should be considered exposed if it is visible, regardless of the height of the material.

If the ACM is located behind a suspended ceiling with movable tiles, a close inspection must be made of the condition of the suspended ceilings, the

likelihood and frequency of access into the suspended ceiling, and whether the suspended ceiling forms a complete barrier or is only partially concealing the material.

ACM above a suspended ceiling is considered exposed if the space above the suspended ceiling comprises an air plenum. Suspended ceiling with numerous louvers, grids or other open spaces should be considered exposed.

This factor is comprised of three levels:

A. MATERIAL NOT EXPOSED: Located above suspended ceiling or other enclosing material. None visible without removing panels, ceiling sections, or other material. Suspended ceiling is not damaged.

NUMERICAL VALUE: 0

B. TEN PERCENT OR LESS OF THE MATERIAL IS EXPOSED: A few panels of a suspended ceiling have been removed. Small areas of pipe lagging cover or boiler jackets broken. Spaces between ceiling tiles or other coverings exist which would allow fibers to pass through the barrier.

NUMERICAL VALUE: 1

C. GREATER THAN TEN PERCENT OF THE MATERIAL IS EXPOSED.

NUMERICAL VALUE: 4

3.1.1.4 Factor Four - Accessibility

If the friable ACM can be reached by building users or maintenance people either directly or by impact from objects used in the area, it is accessible and subject to accidental or intentional contact and damage. Material which is accessible is most likely to be disturbed in the future.

Evidence of degree of accessibility can also be determined by examining asbestos containing surfaces for impact marks, gouges, scrapes, finger marks, items thrown into the material, etc. Even coated ceilings 25 feet high have been observed with pencils, pens, forks and other items stuck in the material. Also note such practices as stacking boxes from floor to ceiling. The top box may scrape the asbestos containing coating off the ceiling when it is moved.

The proximity of the friable ACM to heating, ventilation, lighting and plumbing systems requiring maintenance or repair may increase its accessibility.

In addition, the activities and behavior of persons using the building should be included in the assessment of whether the material is accessible. For example, persons involved in athletic activities may accidentally cause damage to the material on the walls and ceilings of gymnasiums through contact by balls or athletic equipment. Ladders and similar equipment may be stored on pipe lagging or boilers. To become fully aware of the uses of the building by its occupants, the inspector should consult with building staff or personnel familiar with routine building activities.

This factor is comprised of three levels:

- A. NOT ACCESSIBLE: The material is located above a tight suspended ceiling or is concealed by ducts or piping. The building occupants cannot contact the material.

NUMERICAL VALUE: 0

- B. RARELY ACCESSIBLE: The material is contacted only during abnormal activity such as infrequent maintenance or repair of nearby heating ventilation, lighting or plumbing systems. Building occupants rarely touch or disturb the material.

NUMERICAL VALUE: 1

- C. HIGHLY ACCESSIBLE: Material is contacted frequently due to routine maintenance. The building occupants can contact the material during normal activity at which time they routinely touch and dislodge the materials.

NUMERICAL VALUE: 4

3.1.1.5 Factor Five - Activity and Movement

The level of activity and movement in the vicinity of the ACM can affect both the potential for disturbance of the material as well as the level of resuspension of the fibers which have come loose from the material. Consider not only the movement caused by the activities of people in the area but also

movement from other sources such as high vibration from adjacent rooms, highways, etc.

Another source of vibration is sound, such as music or noise from mechanical equipment. Sound sets airwaves in motion at certain frequencies. As these sound waves impact on ACM, they may vibrate this material and contribute to fiber release. Therefore fibers may be released to a greater extent in a band room, music practice room, auditorium, or mechanical room than in the remainder of the building. Aircraft noise also has the ability to vibrate buildings. While there is no research data which would substantiate a hypothesis that sound vibrations could contribute to fiber release, common sense would indicate that this theory has merit.

The level of activity can best be described by identifying the purpose of the area as well as estimating the number of persons who enter the area on a typical day.

This factor is comprised of three levels:

A. NONE OR LOW ACTIVITY: This level would normally include areas such as administrative offices, libraries, and those classroom whr the population is quiet and non-destructive.

NUMERICAL VALUE: 0

B. MODERATE ACTIVITY: This level describes corridors, rooms or other areas where activities exist that could create undue vibration. This vibration could result in fibers being released from the material into the immediate area.

NUMERICAL VALUE: 1

C. HIGH ACTIVITY LEVEL: This level may be found in cafeterias, shops, some mechanical spaces and corridors whose occupants are vandalous or disruptive in their activities. This also includes all gymnasiums, swimming pools and rooms containing machinery.

NUMERICAL VALUE: 2

3.1.1.6 Factor Six - Air Plenum or Direct Air Stream

An air plenum exists when the return (or, in rare cases, conditioned) air leaves a room or hall through vents in a suspended ceiling and travels at low speed and pressure through the space between the actual ceiling and the suspended ceiling or ducts. In evaluating whether an air plenum or direct air stream is present the inspector must look for evidence of ducts or cavities used to convey air to and from heating or cooling equipment or the presence of air vents or outlets which blow air directly onto friable material.

A typical construction technique is to use the space between a suspended ceiling and the actual ceiling as a return air plenum. In many cases tiles in the suspended ceiling must be lifted to check if this is the case. Inspection of the air handling or HVAC equipment rooms may also provide evidence of the presence of this material in the plenums.

Special attention will be paid to whether activities such as maintenance frequently occur which would disturb the material in the plenum. Also any evidence that the material is being released or eroded (i.e. is it damaged or deteriorated so that the material is free to circulate in the airstream) such as accumulations of the material in the plenum will be noted.

The presence of a direct air stream is indicated by discoloration of the asbestos coating in the vicinity of a vent or erosion patterns may be evident in the ACM. This factor is comprised of two levels:

A. NO AIR PLENUM OR DIRECT AIR STREAM PRESENT:

NUMERICAL VALUE: 0

B. AIR PLENUM OR DIRECT AIR STREAM PRESENT: Look for dust patterns deposited by an air stream on surfaces next to air supply diffusers. Any rooms coated with ACM may be contributing asbestos fibers to the building air if the circulation system draws air from such a coated room. Look for debris from the ACM being deposited on dampers and filters of the air intake.

NUMERICAL VALUE: 1

3.1.1.7 Factor Seven - Friability

The term "friable" is applied to material that can be crumbled, pulverized, or reduced to powder by hand pressure. In order to evaluate the friability of the material it must be touched. The ACM can vary in degree of friability. The more friable the material, the greater the potential for asbestos fiber release and contamination. Spray applied ACM is generally more friable than trowel applied material.

This factor is comprised of four levels:

A. NOT FRIABLE: Material that is hard and crusty. Cannot be damaged by hand. Sharp tools required to penetrate material.

NUMERICAL VALUE: 0

B. LOW FRIABILITY: Material that is difficult yet possible to damage by hand. Material can be indented by forceful impact. If the granular, cementitious ACM is rubbed, it leaves granules on the hand but no powder.

NUMERICAL VALUE: 1

C. MODERATE FRIABILITY: Fairly easy to dislodge and crush or pulverize. Material may be removed in small or large pieces. Material is soft and can easily be indented by hand pressure. The granular, cementitious ACM leaves a powder residue on the hands when rubbed.

NUMERICAL VALUE: 2

D. HIGH FRIABILITY: The material is fluffy, spongy, or flaking and may have pieces hanging down. Easily crushed or pulverized by minimal hand pressure. Material may disintegrate or fall apart when touched.

NUMERICAL VALUE: 3

3.1.1.8 Factor Eight - Asbestos Content

The percentage for all types of asbestos present should be added for the total asbestos content. The numerical value is assigned based upon the report of analysis, not on appearance of the material.

With a high percentage of asbestos, there are more fibers that can be released and contaminate the building environment. Therefore, if certain areas are

identical in their assessment using the other seven factors, this factor will be helpful in establishing priorities and indicating which area needs to be addressed first.

This factor is comprised of three levels:

A. TRACE AMOUNTS TO LESS THAN ONE PERCENT.

NUMERICAL VALUE: 0

B. ONE PERCENT TO FIFTY PERCENT. Ceiling and wall coatings most frequently encountered in this category were the granular, cementitious acoustical plasters.

NUMERICAL VALUE: 2

C. FIFTY PERCENT TO ONE HUNDRED PERCENT. Most frequently materials containing over 50% asbestos were pipe and boiler wrapping or the fibrous, cotton candy type, sprayed-on insulation.

NUMERICAL VALUE: 3

3.2 STEP 2: EXPOSURE NUMBER CALCULATION

The Exposure Number is derived from the Factor Scores by a formula. After entering the chosen Factor Scores on lines 1 through 8 of the Asbestos Factor Score Sheet (Appendix C):

- a) Sum factors 1 through 6 and enter opposite SUM;
- b) Multiply factor 7 times factor 8, and enter opposite PRODUCT;
- c) Multiply SUM times PRODUCT and enter opposite EXPOSURE NUMBER.

This number represents the result of the assessment for each area of the building. The values can range from 0 to 162. The higher the numerical value, the greater the potential for fiber release and, therefore, the more hazardous the situation. The Exposure Number must now be compared to the Corrective Action Scale, which is Step 3.

3.3 STEP 3: COMPARISON OF EXPOSURE NUMBER TO CORRECTIVE ACTION SCALE

Table 1, Corrective Action Scale (developed by the EPA), presents four types of corrective action, a brief description of each, and a range of Exposure Numbers for which that Corrective Action is appropriate. Compare the Exposure Number derived in Step 2 to the ranges in Table 1 to determine whether action is needed. For example, an Exposure Number of 60 suggests that the asbestos should be removed. An Exposure Number of 10, however, might suggest encapsulation or deferral of action. In this case it is necessary to further analyze the situation, perhaps to consider factors such as length of time that action could be deferred.

The Exposure Number can be used:

- (1) To determine whether corrective action can be deferred or initiated. With a score of zero to twelve, corrective action can usually be deferred. This is assuming that a continuing inspection program will be implemented and that inadvertent damage to the material will be avoided.
- (2) To set priorities for decision making. The higher the exposure number, the higher the priority.
- (3) To select a corrective action. The exposure number indicates methods found to be appropriate in school exposure situation. The corrective action scale is to be considered as a guideline for decision making. Local conditions will have significant influence on corrective action selection.

TABLE 1

CORRECTIVE ACTION SCALE

<u>CORRECTIVE ACTION</u>	<u>EXPOSURE NUMBER RANGE</u>
<u>Deferred Action</u>	0-12
<u>Encapsulation</u> There appears to be a wide range of numbers and conditions where use of a sealant has provided a satisfactory solution. Encapsulation seems to be appropriate especially for conditions where there is a large area exposed (Factor 3) and there is a low score for the other factors. It is inappropriate to use encapsulation where severe water damage or the potential for water damage is evident (Factor 2). A high accessibility factor (Factor 4) also indicates that encapsulation is inappropriate.	
<u>Enclosure</u> Enclosure has been used over virtually the entire range from below 10 to above 100. It is also, by far, the least used corrective method. It is an inappropriate corrective method in the same situations where encapsulation is inappropriate (Factors 3, 2, and 4).	10-50
<u>Removal</u> Removal is the only complete solution. It is usually appropriate where the exposure indicates a high exposure problem. Removal can be inappropriate if the asbestos material must be removed from a complex surface (such as pipes, lines, and ducts) which is relatively inaccessible.	40 and over

APPENDIX C

BULK SAMPLE SUMMARY AND CHAIN-OF-CUSTODY FORMS

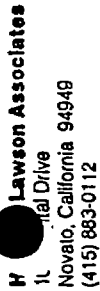
APPENDIX C
BULK SAMPLING SUMMARY
USARC - LONG BEACH

Sample Number	Material Sampled	Sample Location	HR/ RAR*	Analytical Results**
AV0821101	Gray roofing mastic	Main building, middle of north wing roof off ducting	1/7	15-20% C
AV0821102	12- by 12-inch white mottled floor tile and associated mastic	Room 106, southeast corner	1/7	Trace C mastic = 20-25%
AV0821103	12- by 12-inch white mottled floor tile and associated mastic	Room 115 (kitchen), south wall	1/7	Trace C mastic = 1-5%
AV0821104	12- by 12-inch white mottled floor tile and associated mastic	Room 208, southeast corner	1/7	Trace C mastic = 1-5%
AV0821105	Gray baseboard and associated mastic	Room 101, northwest corner		ND
AV0821106	Gray baseboard and associated mastic	Room 208, near northwest corner		ND
AV0821107	QC of sample AV0821104	Same as AV0821104	1/7	Trace C mastic = 8%

* HR/RAR = Hazard Rank/Response Action Recommendation Codes

** ND = no asbestos detected

C = chrysotile asbestos



ASBESTOS SAMPLING CHAIN OF CUSTODY

page _____ of _____

Signature: 
Sampler / Printed Name: ALEX VARGAS

Signature:

Job Number: 3026 | .002434

Date:

8/23/95

Project Name: USARC - Long Beach

Laboratory:

ISSUE

Send Results To: Alex Vargas

Santa Ana

Project Manager: Don Bates

Remarks: KILA
3 HUTTON CENTRE DR. SUITE 300
SAVATE AVENUE CA. 92707

DR. SUITE 300
CA. 92707

[illegible]

Chain of Custody Record

Method of Shipment:

Courier:
Date:

Airbill #:
Time:

Relinquished By:

ALEX / ADAS

Date:

Time: _____

Received By:

Received By: Neer Moore

Date: _____ Time: _____

Revised By:

1000000

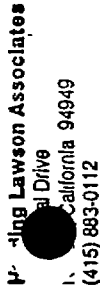
Date:

Time:

Received By:

Date:

LABORATORY COPY: WHITE Protected Office Copy, YELLOW Field or Office Copy; PINK

page 7 of 7

/Signature:

Send Invoice To: Santa Ana

714-557-7992
Fax 714-662-2992

TURN
A.ROUND
TIME

Airbill #:
Time:

Date: _____ Time: _____

Date: _____ Time: _____

APPENDIX D
BULK SAMPLE AND QA/QC LABORATORY SAMPLE REPORTS



Forensic Analytical
Analytical Report

San Francisco • 3777 Depot Road Suite 403, Hayward CA 94545 • Phone 510/887-8828 • Fax 510/887-4218
Los Angeles • 2959 Pacific Commerce Dr., Rancho Dominguez, CA 90221 • Phone 310/763-2374 • Fax 310/703-8694

Bulk Asbestos Analysis Summary
40 CFR 763, Subpart F, Appendix A (AHERA)

Client:
Harding Lawson Associates

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Client ID: 5231
Report Number: 575964
Date Received: 08/25/95

P.O. Num:
Job ID: 30261.002232
Site: USARC - Long Beach, Ca.

Sample Number Location/Description	Date Col.	Lab Num.	Asbestos Present	(Breakdown by type)
AV0821-101 Gray roofing mastic.	08/21/95	59537735	15-20%	Chrysotile (15-20%)
AV0821-102 12" x 12" white mottled floor tile and mastic.	08/21/95	59537736	Trace%	Chrysotile (Trace%)
AV0821-103 12" x 12" white mottled floor tile and mastic.	08/21/95	59537737	Trace%	Chrysotile (Trace%)
AV0821-104 12" x 12" white mottled floor tile and mastic.	08/21/95	59537738	Trace%	Chrysotile (Trace%)
AV0821-105 Gray baseboard & mastic.	08/21/95	59537739	Non-Det.%	
AV0821-106 Gray baseboard & mastic.	08/21/95	59537740	Non-Det.%	

Matilde Antillon

Matilde Antillon, Laboratory Supervisor, Rancho Dominguez Laboratory

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Bulk Material Analysis
Method: 40 CFR 763, Subpart F, Appendix A (AHERA)

Client:
Harding Lawson Associates

Client Number: 5231
Report Number: 575964
Date Received: 08/25/95

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Lab Number: 59537735
Sample Number: AV0821-101
P.O. Num:
Job ID: 30261.002232
Site: USARC - Long Beach, Ca.

Date Collected: 08/21/95

Location: Gray roofing mastic.

Gross Description: Gray roofing mastic.

Comments:

Microscopic Description

TOTAL ASBESTOS PRESENT:

15-20 %

Chrysotile
Amosite

15-20 %
Non-Det. %
%
%

TOTAL NON-ASBESTOS FIBROUS MATERIAL PRESENT:

Trace %

Cellulose
Fibrous Glass

Trace %
Non-Det. %
%
%

TOTAL NON-ASBESTOS NONFIBROUS MATERIAL PRESENT:

80-85 %



Forensic Analytical
Analytical Report

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Los Angeles • 2959 Pacific Commerce Dr., Rancho Dominguez CA 90221 • Phone 310/763-2074 • Fax 310/763-8684

Bulk Material Analysis
Method: 40 CFR 763, Subpart F, Appendix A (AHERA)

Client:
Harding Lawson Associates

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Client Number: 5231
Report Number: 575964
Date Received: 08/25/95

Lab Number: 59537736
Sample Number: AV0821-102
P.O. Num:
Job ID: 30261.002232
Site: USARC - Long Beach, Ca.

Date Collected: 08/21/95

Location: 12" x 12" white mottled floor tile and mastic.

Gross Description: Off-white tile with black mastic.

Comments: Asbestos in mastic (20-25%). Composite reported.

Microscopic Description

TOTAL ASBESTOS PRESENT:

Chrysotile
Amosite

Trace %
Non-Det. %
%
%

Trace %

TOTAL NON-ASBESTOS FIBROUS MATERIAL PRESENT:

Cellulose
Fibrous Glass

Trace %
Non-Det. %
%
%

Trace %

TOTAL NON-ASBESTOS NONFIBROUS MATERIAL PRESENT:

98-99 %



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Analytical Report

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Bulk Material Analysis

Method: 40 CFR 763, Subpart F, Appendix A (AHERA)

Client:

Harding Lawson Associates

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Client Number: 5231

Report Number: 575964

Date Received: 08/25/95

Lab Number: 59537737

Sample Number: AV0821-103

P.O. Num:

Job ID: 30261.002232

Site: USARC - Long Beach, Ca.

Date Collected: 08/21/95

Location: 12" x 12" white mottled floor tile and mastic.

Gross Description: Off-white tile with black mastic.

Comments: Asbestos in mastic (1-5%). Composite reported.

Microscopic Description

TOTAL ASBESTOS PRESENT:

Chrysotile

Amosite

Trace %

Non-Det. %

%

%

Trace %

TOTAL NON-ASBESTOS FIBROUS MATERIAL PRESENT:

Cellulose

Fibrous Glass

Trace %

Non-Det. %

%

%

Trace %

TOTAL NON-ASBESTOS NONFIBROUS MATERIAL PRESENT:

98-99 %



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Analytical Report

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Los Angeles • 2959 Pacific Commerce Dr. Rancho Dominguez CA 90221 • Phone 310/763-2374 • Fax 310/763-8554

Bulk Material Analysis
Method: 40 CFR 763, Subpart F, Appendix A (AHERA)

Client:
Harding Lawson Associates

Client Number: 5231
Report Number: 575964
Date Received: 08/25/95

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Lab Number: 59537738
Sample Number: AV0821-104
P.O. Num:
Job ID: 30261.002232
Site: USARC - Long Beach, Ca.

Date Collected: 08/21/95

Location: 12" x 12" white mottled floor tile and mastic.

Gross Description: Off-white tile with black mastic.

Comments: Asbestos in mastic (1-5%). Composite reported.

Microscopic Description

TOTAL ASBESTOS PRESENT:		Trace	%
Chrysotile	Trace	%	
Amosite	Non-Det.	%	
		%	
		%	
TOTAL NON-ASBESTOS FIBROUS MATERIAL PRESENT:		Trace	%
Cellulose	Trace	%	
Fibrous Glass	Non-Det.	%	
		%	
		%	
TOTAL NON-ASBESTOS NONFIBROUS MATERIAL PRESENT:		98-99	%



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Analytical Report

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Los Angeles • 2959 Pacific Commerce Dr. Pico Park CA 90021 • Phone 310/763-2374 • Fax 310/763-6684

Bulk Material Analysis
Method: 40 CFR 763, Subpart F, Appendix A (AHERA)

Client:
Harding Lawson Associates

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Client Number: 5231
Report Number: 575964
Date Received: 08/25/95

Lab Number: 59537739
Sample Number: AV0821-105
P.O. Num:
Job ID: 30261.002232
Site: USARC - Long Beach, Ca.

Date Collected: 08/21/95

Location: Gray baseboard & mastic.

Gross Description: Gray baseboard with beige fibrous material and
paint.

Comments:

Microscopic Description

TOTAL ASBESTOS PRESENT:

Chrysotile
Amosite

Non-Det. %

Non-Det. %

%

%

Non-Det. %

TOTAL NON-ASBESTOS FIBROUS MATERIAL PRESENT:

Cellulose
Fibrous Glass

15-20 %

Non-Det. %

%

%

15-20 %

TOTAL NON-ASBESTOS NONFIBROUS MATERIAL PRESENT:

80-85 %



Forensic Analytical
Analytical Report

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Los Angeles • 2959 Pacific Commerce Dr., Rancho Dominguez CA 90221 • Phone 310-763-2374 • Fax 310-763-8584

Bulk Material Analysis
Method: 40 CFR 763, Subpart F, Appendix A (AHERA)

Client:
Harding Lawson Associates

3 Hutton Centre, Suite 300
Santa Ana, CA 92707

Client Number: 5231
Report Number: 575964
Date Received: 08/25/95

Lab Number: 59537740
Sample Number: AV0821-106
P.O. Num:
Job ID: 30261.002232
Site: USARC - Long Beach, Ca.

Date Collected: 08/21/95

Location: Gray baseboard & mastic.

Gross Description: Gray baseboard.

Comments:

Microscopic Description

TOTAL ASBESTOS PRESENT:

Non-Det. %

Chrysotile
Amosite

Non-Det. %
Non-Det. %
%
%

TOTAL NON-ASBESTOS FIBROUS MATERIAL PRESENT:

Trace %

Cellulose
Fibrous Glass

Trace %
Non-Det. %
%
%

TOTAL NON-ASBESTOS NONFIBROUS MATERIAL PRESENT:

99-100 %

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POLARIZED LIGHT MICROSCOPY

1024

Harding Lawson Associates
3 Hutton Centre Dr., Suite 300
Santa Ana, CA 92707

JOB SITE:

USARC
VARIOUS LOCATIONS
JOB NO. 30261.002232

Date Sampled 8-31-95

Date Received 9/1/95

Total Samples 8

Micro Log In 27774

SAMPLE INFORMATION		ASBESTOS MINERALS PERCENT TYPE	NON ASBESTOS FIBERS PERCENT TYPE	NON FIBROUS MATRIX PERCENT TYPE
Client: AVO811-005		< 1 CHRYSOTILE	ND	99-100 CALCITE, VINYL, TAR, MISC. PARTICLES.
Micro: 27774-01 Analyst: SM		TILE: ND MASTIC: 10% CHRYSOTILE		
WHITE MOTTLED FLOOR TILE & MASTIC GARDEN GROVE				
Client: AVO814-405		< 1 CHRYSOTILE	ND	99-100 CALCITE, VINYL, TAR, MISC. PARTICLES.
Micro: 27774-02 Analyst: SM		TILE: ND MASTIC: 18% CHRYSOTILE		
WHITE MOTTLED FLOOR TILE & MASTIC MONTE				
Client: AVO818-012		30 CHRYSOTILE	ND	70 CALCITE, VINYL, MISC. PARTICLES.
Micro: 27774-03 Analyst: SM		THERE IS NOT ENOUGH MASTIC FOR ANALYSIS		
9X9 RED FLOOR TILE & MASTIC VAN NUYS				
Client: AVO821-107		< 1 CHRYSOTILE	ND	99-100 CALCITE, VINYL, TAR, MISC. PARTICLES.
Micro: 27774-04 Analyst: SM		TILE: ND MASTIC: 8% CHRYSOTILE		
WHITE MOTTLED FLOOR TILE & MASTIC LONG BEACH				
Client: AVO829-909		ND	ND	100 CALCITE, VINYL, TAR, MISC. PARTICLES.
Micro: 27774-05 Analyst: SM		TILE: ND MASTIC: ND		
WHITE MOTTLED FLOOR TILE & MASTIC WEST LA				

Laboratory Director

Yianping Li, Ph.D.

9/1/95

Analyses follow EPA - 600/M4-82-020, 1982. Asbestos percentage is reported as projected area percent, based on calibrated visual estimates. A note is if asbestos is quantified by point counting. ND: None detected by PLM. The detection limit is material dependent, and is less than 1% for most friable building materials. Individual layers of heterogeneous samples are analyzed separately; asbestos percentages are reported for the overall sample, and for individual layers as well. The absence of asbestos in wipe samples, and in some non-friable materials, including floor tiles, cannot be conclusively established by PLM, and should be independently confirmed by Transmission Electron Microscopy (TEM). NIST / NVLAP Accreditation (Bulk Asbestos) Lab Code: #101872. This report must not be used to claim product endorsement by NIST or any agency of the U.S. Government. This report must not be reproduced except in full, with the approval of Micro Analytical Laboratories, Inc., and pertains only to the samples analyzed herein. n/a = Not Applicable.

APPENDIX E
REMOVAL COST ESTIMATES

APPENDIX E

REMOVAL COST ESTIMATES LONG BEACH USARC, LONG BEACH, CALIFORNIA

MATERIAL	APPROXIMATE QUANTITY	REMOVAL COSTS (\$)
Administration Building - 12- by 12-inch green mottled floor tile mastic (mastic only)	15,000 square feet	30,000
Administration Building - Gray roofing mastic	20 square feet	60
Administration Building - Transite asbestos cement flue pipe	4 linear feet	12

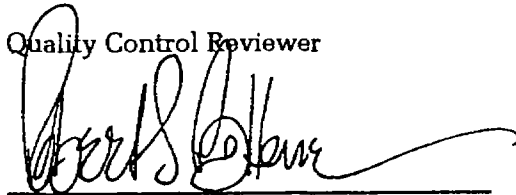
DISTRIBUTION

Asbestos Survey
Long Beach U.S. Army Reserve Center
Long Beach, California
Contract DACA05-92-D-0036
Delivery Order 14
Modification 1

March 4, 1996

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